Overview of Trends in

Canadian mineral exploration

CANADIAN INTERGOVERNMENTAL WORKING GROUP ON THE MINERAL INDUSTRY

2005

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Canadian mineral exploration

Canadian Intergovernmental Working Group
on the Mineral Industry

2005

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The cover photo shows winter drilling activity by Wallbridge Mining Company Limited at Windy Lake, northwest of Sudbury, Ontario. The company was awarded an Environmental Award by the Prospectors and Developers Association of Canada (PDAC) in 2004 for its exemplary care of and commitment to preserving the natural and local environment during its exploratory drilling for nickel-copper-platinum group element mineralization on Windy Lake.

Preface

The *Overview of Trends in Canadian Mineral Exploration* report is prepared annually, on behalf of the Intergovernmental Working Group on the Mineral Industry (IGWG), for presentation to federal, provincial and territorial mines ministers. It contains an analysis of recent indicators of exploration and deposit appraisal activity in Canada, a review of the exploration and deposit appraisal sector of each province/territory, and a review of the worldwide activities of the larger Canadian exploration and mining companies. The information in this report is current as of November 2005.

The analyses, articles and reviews found in this report were prepared by officials of the provincial/territorial departments responsible for mineral exploration and Natural Resources Canada (NRCan). The Minerals and Metals Sector of NRCan was responsible for compiling, editing, producing and distributing this report, which covers exploration and deposit appraisal activities for metallic minerals, nonmetallic minerals, coal and uranium. It does not refer to petroleum-related work.

The report is available on the Internet at www.nrcan.gc.ca/mms/pubs/explor_e.htm.

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Government Contacts/ Information Requests

For further information on specific issues related to this report (i.e., exploration activities and statistics, incentives and programs, rules and regulations, geoscientific data, etc.), the reader is invited to contact the appropriate federal, provincial or territorial authorities at the telephone numbers listed below or to consult their respective web sites. The contact information for officials who prepared the provincial/territorial sections are also provided at the beginning of each of these sections while the NRCan officials who participated in the preparation of this report are listed below. Prince Edward Island is not included because of a current lack of mineral exploration activity.

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Executive Summary

Statistics from the federal-provincial/territorial Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures show that 2005 was another excellent year for the Canadian mineral exploration sector.

In fact, 2005 revised company spending intentions of $1369 million represent the highest total for exploration and deposit appraisal expenditures since the heyday of the Mining Exploration Depletion Allowance (MEDA) in 1987 and 1988. The 2005 spending forecast marks another year of strong growth as spending was expected to increase by a further 16% after a dramatic 72% increase in 2004 that saw expenditures surge to $1178 million from $687 million in 2003. In real terms, exploration and deposit spending in Canada has now been trending upwards since the historical trough of 2000.

The massive increase in spending recorded in 2004 reflects a rapid response by companies to a metal price outlook that improved considerably in the latter part of 2003. This reaction was so sudden that the revised spending intentions survey for 2004 missed the mark by almost $200 million, clearly showing that even the companies themselves did not expect, in their budgeting process, to undertake as much exploration activity as they eventually did during that year. Other factors that contributed to the exceptional performance of the past two years included the availability of generous tax and non-tax incentives, the willingness of investors to support mineral exploration ventures, and a steady stream of positive exploration news.

The context remains very favourable for 2006, particularly in terms of the price outlook for many of the mineral commodities explored for in Canada. However, a mitigating factor is the phasing out of the federal Investment Tax Credit for Exploration (ITCE). Combined with the flow-through-share mechanism, this tax credit resulted in the industry-dubbed "super-flow-through-share-incentive" and contributed to the revival of the junior mining sector in Canada.

The junior mining sector's recovery has been outstanding. After being severely battered by the downward trend of the late 1990s, this essential component of the Canadian mining industry came back so strongly that its total exploration and deposit appraisal spending overtook that of senior companies in 2004. It continued its ascension in 2005 with revised spending intentions amounting to $790 million, or 58% of the total forecasted expenditures for the year.

As a result of this drastically increased junior company spending, expenditures dedicated solely to the exploration work phase are expected to reach $1085 million in 2005, representing 79% of total intended exploration and deposit appraisal spending for that year. Furthermore, $987 million (91%) of this total will be incurred off mine sites, once again leading to a concentration of spending on grass-roots activities outside of mine properties as opposed to on-mine-site, more advanced activities.

This focus on earlier stages of the mineral resource development cycle is positive for the junior mining sector and for the prospect of new mineral deposit discoveries. However, in the current context of declining ore reserves of the principal metals produced in Canada, it is imperative that this exploration drive be successful in discovering new mines and, at the same time, that more advanced exploration and deposit appraisal work, as well as on-mine-site activities, be undertaken.

The future of mining in Canada will no doubt be moulded by some of the deposits being investigated in this period of intense activity by the Canadian mineral exploration industry, and the Regional Outlook section of this report summarizes the most interesting projects currently under way in this country.

Globally, Canada continues to be the foremost destination for exploration capital. In 2004, some 20% of the mineral exploration programs planned by the world's mining companies were expected to be conducted in Canada. As for Canadian companies, they were expected to undertake 43% of all the exploration programs in the world in 2004, a share that is by far the largest of the global mineral exploration market.

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ABBREVIATIONS

The reader should note that a number of abbreviations for common units of measurement appear in the text:

cm	centimetres
ct	carats
ct/ht	carats per hundred tonnes
ct/t	carats per tonne
ct/y	carats per year
ft	feet
g	grams
g/t	grams per tonne
ha	hectares
kg	kilograms
km	kilometres
km^2	square kilometres
lb	pounds
m	metres
Mct	million carats
Mha	million hectares
Mt	million tonnes
Mt/y	million tonnes per year
NTS	National Topographic System
oz	troy ounces
t	tonnes (metric)
t/d	tonnes per day
t/h	tonnes per hour
t/y	tonnes per year
tU	tonnes of uranium

Note: Unless specified otherwise, all dollar figures are in Canadian dollars.

1. Indicators of Mineral Exploration and Deposit Appraisal Activity in Canada

1.1 INTRODUCTION

The first chapter of this report presents data and analysis on indicators of mineral exploration and deposit appraisal activity in Canada. Except where needed for comparing different data sets, it does not cover activities beyond the deposit appraisal stage, such as those related to mine development. The most important of the indicators studied in this report is spending and, accordingly, most of the analysis focuses on expenditure trends and patterns. Chapter 1 also provides analysis on two other indicators of exploration and deposit appraisal activity: drilling and claim staking.

The federal-provincial/territorial Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures was redesigned in 1997 to provide a more comprehensive breakdown of the mineral development cycle in Canada. This breakdown is based on the generalized model of the mineral resource development (**Table 29** in Appendix 2). Detailed cost categories such as engineering, environment, feasibility studies and land access, and a clearer separation between the different work phases, offer expanded analytical options over the pre-1997 survey format. While the former survey data continue to be used to show historical trends, the analysis in this report is primarily based on the set of definitions[1] that was adopted in 1997. For a better understanding of the survey and its definitions, the reader is invited to consult Section 1.2 and Appendix 2.

A further change to the survey methodology was tested and adopted in 2002 with the introduction of a revised survey of company spending intentions. While the initial survey of company spending intentions is conducted in the last quarter of the previous year and compiled in January of the forecast year, the revised company spending intentions survey is conducted in the first half of the forecast year. For 2005, the results of this "revised intentions survey" were released in September 2005, eight months after the release of the original spending intentions forecast. All companies that had reported spending intentions during the first forecast compilation, as well as those that had failed to do so, were surveyed again on how close they are to their previously reported spending plans. This additional surveying exercise improves the forecast capabilities of the entire survey process and provides more timely information on the actual state of mineral exploration for industry stakeholders and decision makers at the provincial-territorial and federal levels of government.

1.2 SUMMARY OF SURVEY DEFINITIONS

In the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures, often referred to as the federal-provincial/territorial survey of mining and exploration companies, exploration is defined as the work carried out on- or off-mine-site to search for, discover and carry out the first delineation of a previously unknown mineral deposit to establish its potential

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[1] A different set of definitions is used in Chapter 3, which contains data and analysis on worldwide exploration activity. That chapter is based on data from the Metals Economics Group.

economic value (tonnage and grade) and to justify further work. Deposit appraisal, on the other hand, includes the work carried out on- or off-mine-site to bring a delineated deposit to the stage of detailed knowledge required for a production feasibility study.

The more detailed cost breakdown of the new survey format adopted in 1997 provides total exploration and deposit appraisal expenditures that are generally higher than the ones obtained from the traditional "field work and overhead" cost categories in the old survey simply because costs related to engineering, economic and feasibility studies, the environment, and land access were not previously accounted for. The survey also collects data on capital and repair costs for construction, machinery and equipment for each of the work phases (exploration, deposit appraisal and mine complex development), but these costs will seldom be referred to in this review. The comprehensive coverage offered by all these categories of expenditures provides a more complete picture of the total investment required to bring projects to the production decision stage.

1.3 EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES

Over the years, levels of exploration and deposit appraisal expenditures have been relied upon to determine the health of Canada's mineral exploration sector and to provide an insight into the future of the country's minerals and metals production capacity. This section focuses on analyzing expenditure data for 2004 and 2005.[2] The data for 2004 are considered to be final. The data for 2005 were compiled in January 2005 and revised in September 2005. They will be finalized in 2006. The section also provides some coverage of the period 1997-2005, which represents the first nine years of data for the redesigned survey. The analysis, figures and tables presented in this chapter are denominated in current Canadian dollars. However, in order to keep an inflation-free perspective, some of the longer-term comparisons that appear in this text are also presented in terms of 2004 constant dollars.

1.3.1 2004 Exploration and Deposit Appraisal Expenditures

1.3.1.1 Statistical Summary

In 2004, 714 companies (project operators) and some prospectors spent $1178 million on mineral exploration and deposit appraisal in Canada (**Figure 1** and **Table 1**). That number of companies represented a significant increase of 10% from the 2003 total of 651 companies (expenditures of $687 million) and a further increase from the low of 541 project operators that was reached in 2000. An impressive total of 187 companies (compared to 115 in 2003) spent more than $1 million each in 2004; these companies' expenditures accounted for 89% of the total expenditures for that year. On an annual basis, projects with spending of $1 million or more have accounted for most of total expenditures (80% or more) since the 1997 survey redesign.

The massive 72% ($491 million) increase in exploration and deposit appraisal spending that occurred between 2003 and 2004 was felt throughout the country as all provinces and territories recorded increases in expenditures (**Figure 2** and **Table 2**). Nunavut (+$95 million), Québec (+$93 million), British Columbia (+$89 million) and Ontario (+$88 million) recorded the largest monetary increases over 2003. Together these four jurisdictions accounted for 74% of the total increase in spending in 2004. The Northwest Territories (+$59 million) and Saskatchewan (+$24 million) also posted remarkable gains.

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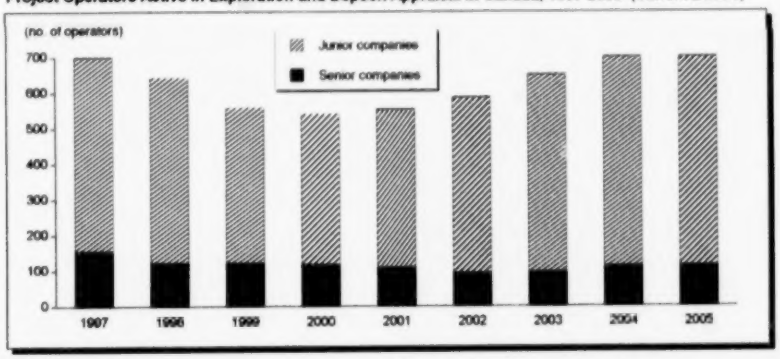
[2] For further analysis of 2004 exploration and deposit appraisal expenditures and a brief discussion of 2005 spending intentions, see Ginette Bouchard, "Mineral Exploration, Deposit Appraisal and Mine Complex Development Activity in Canada" in the 2004 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa.

Figure 1
Project Operators Active in Exploration and Deposit Appraisal in Canada, 1997-2005 (Current Dollars)



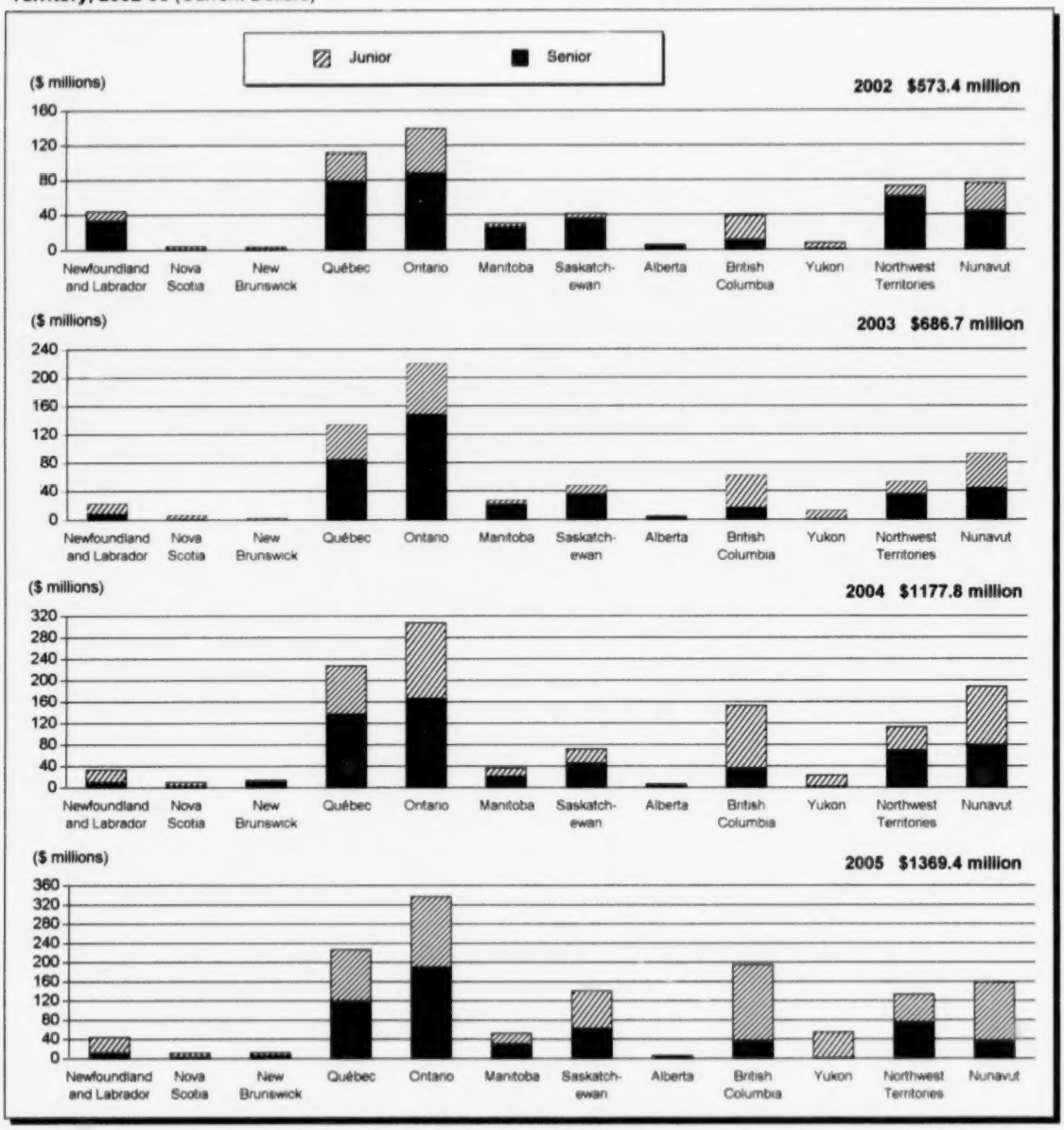
Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Notes: Data include prospectors and prospector groups. Data up to and including 2004 are final; 2005 data are based on revised company spending intentions as compiled in September 2005.

TABLE 1. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES IN CANADA, (1) BY RANGE OF EXPENDITURES AND BY TYPE OF COMPANY, 2002-05 (Current Dollars)

Range of Expenditures	Junior			Senior			Total		
	Companies	Expenditures	Percentage of Total Expenditures	Companies	Expenditures	Percentage of Total Expenditures	Companies	Expenditures	Percentage of Total Expenditures
($)	(number)	($000)	(%)	(number)	($000)	(%)	(number)	($000)	(%)
2002									
>10 million	–	–	–	12	256 148	66.9	12	256 148	44.7
5 million-10 million	6	37 258	19.5	8	56 659	14.8	14	93 917	16.4
1 million-5 million	40	69 855	36.6	23	61 252	16.0	63	131 107	22.9
500 000-1 million	48	32 201	16.9	4	2 918	0.8	52	35 118	6.1
200 000-500 000	89	28 979	15.2	10	3 448	0.9	99	32 427	5.7
100 000-200 000	76	10 888	5.7	9	1 426	0.4	85	12 312	2.1
50 000-100 000	60	3 939	2.1	6	448	0.1	66	4 387	0.8
1-50 000	144	2 828	1.5	21	329	0.1	165	3 157	0.6
Subtotal	463	185 946	97.5	93	382 626	100.0	556	568 573	99.2
Prospectors (2)	30	4 847	2.5	–	–	–	30	4 847	0.8
Total 2002	493	190 793	100.0	93	382 626	100.0	586	573 421	100.0
2003									
>10 million	–	–	–	12	261 891	65.0	12	261 891	38.1
5 million-10 million	8	60 146	21.2	14	93 128	23.1	22	153 274	22.3
1 million-5 million	66	127 868	45.1	15	36 807	9.1	81	164 676	24.0
500 000-1 million	59	40 660	14.3	10	6 547	1.6	69	47 206	6.9
200 000-500 000	105	33 910	12.0	6	2 179	0.5	111	36 089	5.3
100 000-200 000	76	10 662	3.8	9	1 386	0.3	85	12 048	1.8
50 000-100 000	72	5 057	1.8	9	620	0.2	81	5 677	0.8
1-50 000	144	2 353	0.8	21	469	0.1	165	2 842	0.4
Subtotal	530	280 655	98.9	96	403 047	100.0	626	683 703	99.6
Prospectors (2)	25	3 032	1.1	–	–	–	25	3 032	0.4
Total 2003	555	283 688	100.0	96	403 047	100.0	651	686 735	100.0
2004									
>10 million	6	80 773	13.5	16	420 603	72.8	22	501 376	42.6
5 million-10 million	22	155 683	26.0	10	80 607	13.9	32	236 290	20.1
1 million-5 million	111	243 179	40.5	22	61 691	10.7	133	304 870	25.9
500 000-1 million	89	63 673	10.6	12	8 782	1.5	100	72 455	6.2
200 000-500 000	110	36 254	6.0	13	4 154	0.7	123	40 408	3.4
100 000-200 000	74	10 403	1.7	9	1 188	0.2	83	11 591	1.0
50 000-100 000	59	4 226	0.7	9	617	0.1	68	4 842	0.4
1-50 000	119	2 129	0.4	21	424	0.1	140	2 553	0.2
Subtotal	589	596 319	99.4	112	578 067	100.0	701	1 174 385	99.7
Prospectors (2)	13	3 399	0.6	–	–	–	13	3 399	0.3
Total 2004	602	599 718	100.0	112	578 067	100.0	714	1 177 785	100.0
2005 (rsi)									
>10 million	13	199 399	25.2	15	408 916	70.1	28	605 315	44.2
5 million-10 million	24	149 118	18.9	15	93 585	16.2	39	242 703	17.7
1 million-5 million	160	323 813	41.0	25	65 555	11.3	185	389 368	28.4
500 000-1 million	110	71 849	9.1	14	8 897	1.5	124	80 746	5.9
200 000-500 000	106	31 712	4.0	11	3 094	0.5	117	34 806	2.5
100 000-200 000	63	8 194	1.0	10	1 335	0.2	73	9 529	0.7
50 000-100 000	36	2 183	0.3	6	375	0.1	42	2 558	0.2
1-50 000	70	1 201	0.2	17	280	–	87	1 481	0.1
Subtotal	582	787 468	99.6	113	579 036	100.0	695	1 366 504	99.8
Prospectors (2)	11	2 882	0.4	–	–	–	11	2 882	0.2
Total 2005 (rsi)	593	790 350	100.0	113	579 036	100.0	706	1 369 386	100.0

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
– Nil; (rsi) Revised spending intentions.
(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs. (2) The number of prospectors is underestimated because it contains groups of prospectors.
Notes: Numbers may not add to totals due to rounding. Data up to and including 2004 are final; 2005 data are based on revised company spending intentions as compiled in September 2005.

Figure 2
Exploration and Deposit Appraisal Expenditures in Canada by Junior and Senior Companies, by Province and Territory, 2002-05 (Current Dollars)



Sources: Natural Resources Canada and Statistics Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Notes: Exploration and deposit appraisal activities include only the search for and appraisal of new deposits; they do not include work for extensions of deposits already being mined or committed to production. Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site costs incurred for field work and overhead, plus engineering, economic and feasibility studies, environment and land access costs. Data up to and including 2004 are final; 2005 data are revised company spending intentions as compiled in September 2005.

TABLE 2. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES IN CANADA, BY PROVINCE AND TERRITORY, 2002-05 (Current Dollars)

Province/Territory	2002		2003		2004		2005 (rsi)	
	($000)	(%)	($000)	(%)	($000)	(%)	($000)	(%)
Newfoundland and Labrador	44 183.9	7.7	23 073.7	3.4	33 201.6	2.8	43 896.0	3.2
Nova Scotia	3 386.2	0.6	6 390.9	0.9	9 137.8	0.8	11 154.3	0.8
New Brunswick	3 206.3	0.6	2 552.1	0.4	13 377.3	1.1	11 609.7	0.8
Québec	111 207.7	19.4	134 042.9	19.5	227 171.7	19.3	226 546.6	16.5
Ontario	138 969.5	24.2	219 444.4	32.0	306 939.7	26.1	336 597.0	24.6
Manitoba	29 831.3	5.2	27 155.2	4.0	36 036.2	3.1	52 733.4	3.9
Saskatchewan	41 426.2	7.2	47 718.0	6.9	71 786.7	6.1	140 204.4	10.2
Alberta	5 603.2	1.0	4 907.0	0.7	6 332.9	0.5	5 764.5	0.4
British Columbia	39 225.3	6.8	62 517.6	9.1	151 915.1	12.9	194 825.1	14.2
Yukon	7 794.0	1.4	12 674.5	1.8	21 965.9	1.9	54 190.0	4.0
Northwest Territories	72 734.6	12.7	53 565.9	7.8	112 399.2	9.5	133 349.8	9.7
Nunavut	75 852.5	13.2	92 692.9	13.5	187 521.3	15.9	158 515.6	11.6
Total	573 420.6	100.0	686 735.0	100.0	1 177 785.2	100.0	1 369 386.4	100.0
Exploration	403 544.9	70.4	538 052.6	78.3	903 477.9	76.7	1 084 613.9	79.2
Deposit appraisal	169 875.7	29.6	148 682.4	21.7	274 307.3	23.3	284 772.4	20.8

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(rsi) Revised spending intentions.
Notes: Data up to and including 2004 are final; 2005 data are based on revised spending intentions as compiled in September 2005. Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site costs incurred for field work and overhead, plus engineering, economic and feasibility studies, environment and land access costs. Numbers may not add to totals due to rounding.

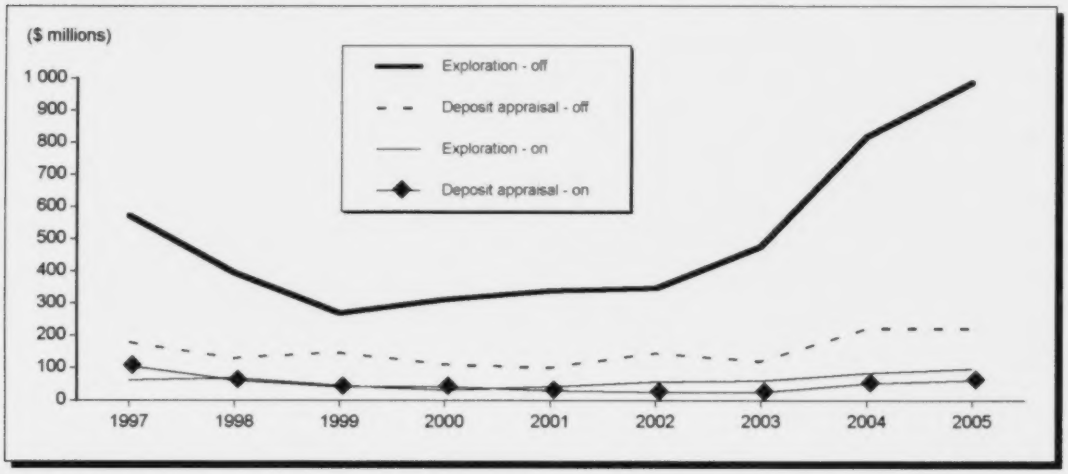
The smaller provinces/territories held their own in terms of proportional increases. In particular, New Brunwick, with a resounding 424% increase, saw its spending rise from $2.6 million in 2003 to $13.4 million in 2004, mostly as a result of the Noranda Inc. (now Falconbridge Limited)-Slam Exploration Limited-Government of New Brunswick Bathurst Joint Venture agreement. British Columbia (+143%), the Northwest Territories (+110%) and Nunavut (+102%) all saw their spending more than double in 2004 while other increases ranged from 29% in Alberta to 73% in the Yukon. The favourable market fundamentals for a variety of mineral commodities, readily available sources of exploration financing, and the momentum generated by positive exploration news were all factors that led to 2004 being an excellent year for mineral exploration in Canada.

Expenditures for off-mine-site exploration and deposit appraisal activity increased by 73% (to $1041 million) from the 2003 level of $601 million (**Figure 3**). This was the fourth consecutive increase in off-mine-site spending. Overall, 88% of all exploration and deposit appraisal expenditures in 2004 was for off-mine-site activity. Ontario ranked first in terms of off-mine-site spending with 22% ($227 million) of the total for that category, followed by Québec and Nunavut with 18% each ($191 million and $187 million, respectively) (**Figure 4**).

On-mine-site exploration and deposit appraisal expenditures finally showed signs of returning to more adequate levels with an increase of 60% in 2004 (to $137 million). In 2003, this type of spending had amounted to $86 million, a total slightly better than the previous three years but still far from the more robust on-mine-site spending that took place in 1997 (the first year of the redesigned survey) when expenditures reached $193 million in constant 2004 dollars. Although dwarfed by off-mine-site investment levels, this renewed interest in on-mine-site spending is welcome in the current context of steadily declining ore reserve levels (**Table 3**) and a bleak economic outlook for some mining communities, particularly on the base-metals side of the industry.[3]

[3] For a discussion on the state of Canada's ore reserves, see Alan Reed, "Canadian Reserves of Selected Major Metals and Recent Production Decisions" in the 2004 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa.

Figure 3
On-Mine-Site and Off-Mine-Site Exploration and Deposit Appraisal Expenditures (1) **in Canada, 1997-2005** (Current Dollars)



Source: Natural Resources Canada, from the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) On-mine-site and off-mine-site exploration and deposit appraisal expenditures include field work and overhead costs, plus engineering, economic and feasibility studies, environment and land access costs.
Note: Data up to and including 2004 are final; 2005 data are revised company spending intentions as compiled in September 2005.

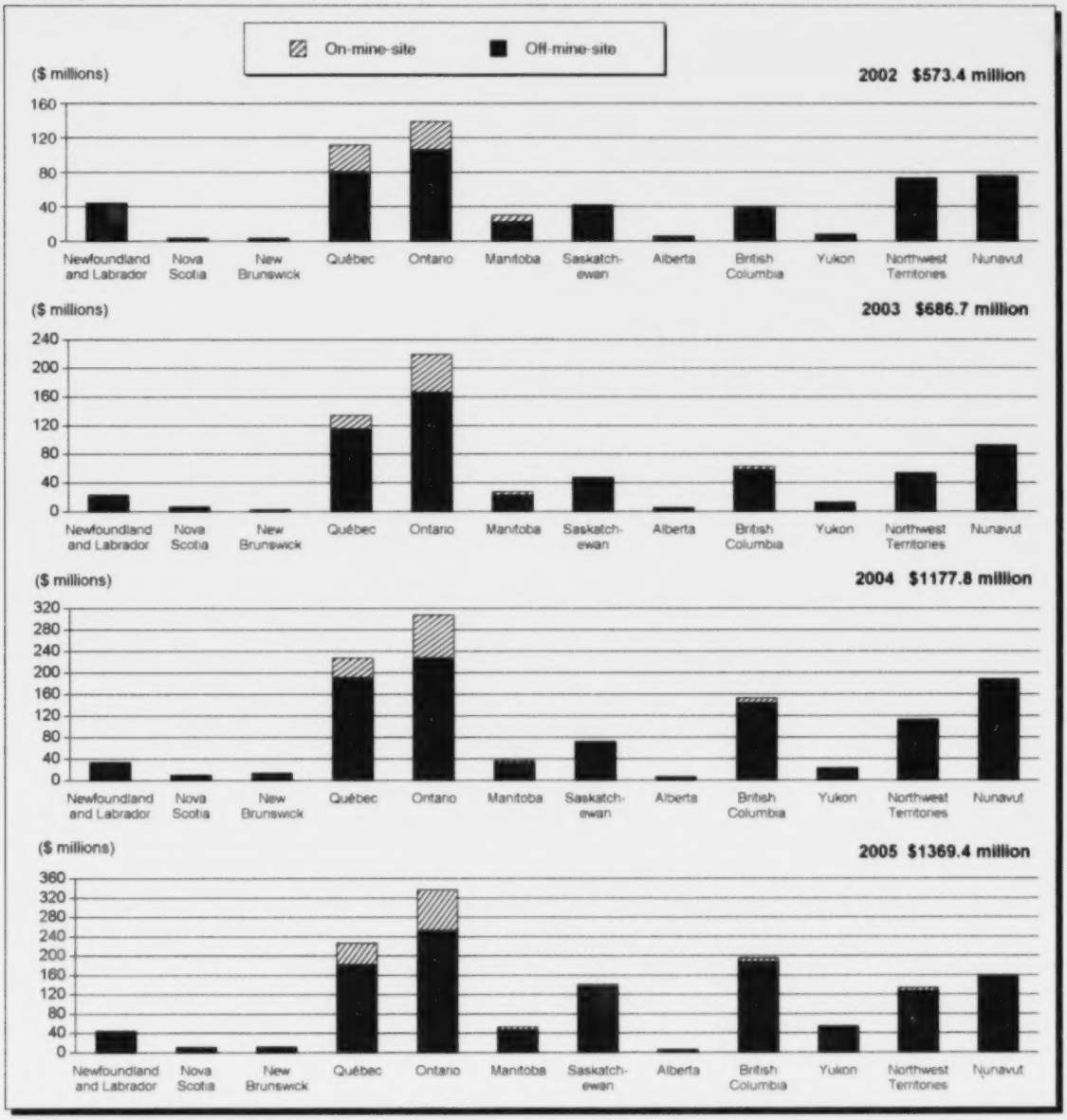
Ontario recorded the highest proportion of on-mine-site spending with 26% of total exploration and deposit appraisal expenditures while Québec (16%) and Manitoba (13%) ranked second and third, well ahead of any other province or territory. These three provinces were also the national leaders in terms of on-mine-site spending in the previous three years but, of the three, only Ontario has managed to record substantial increases year after year. In 2004, a total of $80 million was dedicated to on-mine-site exploration and deposit appraisal in that province. In dollar terms, British Columbia has also seen its record improve in the past few years to the point where $9 million was spent on-mine-site in that province in 2004. The latter, together with the two leaders, Ontario and Québec, and Manitoba, accounted for 95% ($130 million) of the Canadian total for on-mine-site exploration and deposit appraisal expenditures in 2004.

1.3.1.2 Spending by Work Phase

A breakdown of spending by work phase (exploration and deposit appraisal) shows that exploration expenditures progressed dramatically during 2004. In fact, this type of expenditure rose by 68% to reach $903 million (77% of total exploration and deposit appraisal spending for the year). In percentage terms, deposit appraisal spending performed even better, increasing by 84% to stand at $274 million (23% of total spending) (**Figure 5** and **Table 4**). In 2003, spending on the exploration phase had amounted to $538 million while a total of $149 million had been spent on deposit appraisal. The continuation and acceleration of the upward trend in exploration expenditures that began in 1999 is certainly good news as far as grass-roots exploration is concerned. This intense search for new deposits should at the very least result in a wealth of new geoscientific data and information and, hopefully, in the discovery of attractive economic deposits. As for the increased deposit appraisal effort, this represents a much needed focus on some of the more promising deposits.

Off-mine-site spending of $819 million represented 91% of total spending in the exploration work phase in 2004 (**Figure 3**). Over the period 1997-2004, off-mine-site spending has consistently represented over 85% of total exploration-phase expenditures. In terms of deposit appraisal

Figure 4
On-Mine-Site and Off-Mine-Site Exploration and Deposit Appraisal Expenditures in Canada, by Province and Territory, 2002-05 (Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Notes: Exploration and deposit appraisal activities include only the search for and appraisal of new deposits; they do not include work for extensions of deposits already being mined or committed to production. Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site costs incurred for field work and overhead, plus engineering, economic and feasibility studies, environment and land access costs. Data up to and including 2004 are final; 2005 data are revised company spending intentions as compiled in September 2005.

TABLE 3. CANADIAN RESERVES OF SELECTED MAJOR METALS AS AT DECEMBER 31 OF EACH YEAR, 1977-2004

Metal Contained in Proven and Probable Mineable Ore (1) in Operating Mines (2) and Deposits Committed to Production

Year	Copper	Nickel	Lead	Zinc	Molybdenum	Silver	Gold (3)
	(000 t)	(000 t)	(000 t)	(000 t)	(000 t)	(t)	(t)
1977	16 914	7 749	8 954	26 953	369	30 991	493
1978	16 184	7 843	8 930	26 721	464	30 995	505
1979	16 721	7 947	8 992	26 581	549	32 124	575
1980	16 714	8 348	9 637	27 742	551	33 804	826
1981	15 511	7 781	9 380	26 833	505	32 092	851
1982	16 889	7 546	9 139	26 216	469	31 204	833
1983	16 214	7 393	9 081	26 313	442	31 425	1 172
1984	15 530	7 191	9 180	26 000	361	30 757	1 208
1985	14 201	7 041	8 503	24 553	331	29 442	1 373
1986	12 918	6 780	7 599	22 936	312	25 914	1 507
1987	12 927	6 562	7 129	21 471	231	25 103	1 705
1988	12 485	6 286	6 811	20 710	208	26 122	1 801
1989	12 082	6 092	6 717	20 479	207	24 393	1 645
1990	11 261	5 776	5 643	17 847	198	20 102	1 542
1991	11 040	5 691	4 957	16 038	186	17 859	1 433
1992	10 755	5 605	4 328	14 584	163	15 974	1 345
1993	9 740	5 409	4 149	14 206	161	15 576	1 333
1994	9 533	5 334	3 861	14 514	148	19 146	1 513
1995	9 250	5 832	3 660	14 712	129	19 073	1 540
1996	9 667	5 623	3 450	13 660	144	18 911	1 724
1997	9 032	5 122	2 344	10 586	149	16 697	1 510
1998	8 402	5 683	1 845	10 159	121	15 738	1 415
1999	7 761	4 983	1 586	10 210	119	15 368	1 326
2000	7 419	4 782	1 315	8 876	97	13 919	1 142
2001	6 666	4 335	970	7 808	95	12 593	1 070
2002	6 774	4 920	872	6 871	82	11 230	1 023
2003	6 176	4 303	749	6 251	78	9 245	1 042
2004	5 586	4 025	631	5 226	80	7 469	806

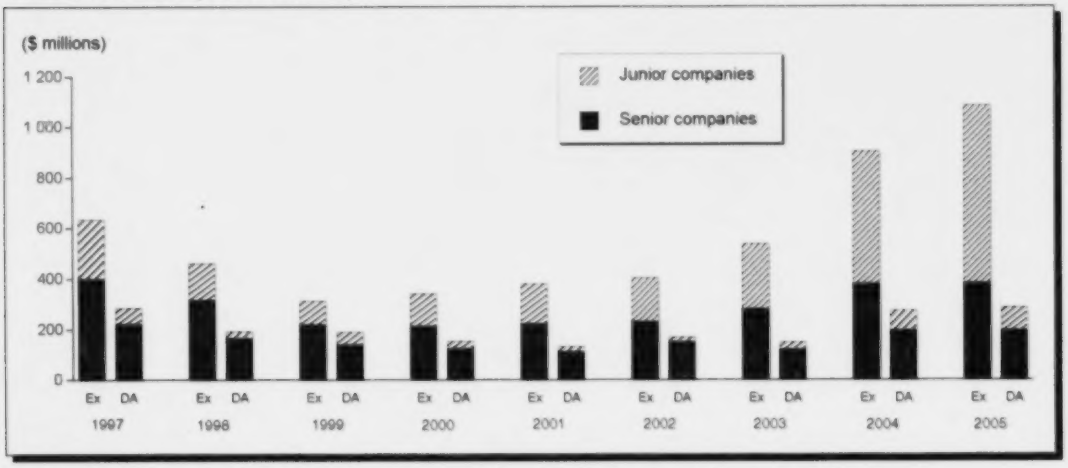
Source: Natural Resources Canada, based on company reports and the Federal-Provincial/Territorial Survey of Mines and Concentrators.

(1) No allowance is made for losses in milling, smelting and refining. Excludes material classified as "possible." Includes "geological reserves" for some mines that do not report mineable ore. (2) Includes metal in mines where production has been suspended temporarily. (3) Excludes metal in placer deposits because reserves data are generally unavailable.

Note: One tonne (t) = 1.1023113 short tons = 32 150.746 troy oz.

Figure 5

Exploration and Deposit Appraisal Expenditures in Canada, by Type of Company and by Work Phase, 1997-2005 (Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.

Ex Exploration; DA Deposit appraisal.

Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Data up to and including 2004 are final; 2005 data are revised company spending intentions as compiled in September 2005.

TABLE 4. EXPLORATION, DEPOSIT APPRAISAL AND MINE COMPLEX DEVELOPMENT EXPENDITURES IN CANADA, (1) 2003 AND 2004
(Current Dollars)

Expenditure Category	Exploration		Deposit Appraisal		Exploration Plus Deposit Appraisal		Mine Complex Development		Grand Total	
	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004
					($000)					
Field work and overhead (2)	523 460	871 867	90 691	191 092	614 151	1 062 959	679 495	797 848	1 293 646	1 860 806
Engineering, economic and pre- or production feasibility studies	10 641	21 748	39 770	62 129	50 411	83 876	23 656	27 749	74 067	111 626
Environment	2 678	7 722	15 104	19 734	17 782	27 456	73 483	76 645	91 265	104 101
Land access	1 274	2 142	3 117	1 353	4 391	3 494	10 077	10 874	14 468	14 368
Subtotal	538 053	903 478	148 682	274 307	686 735	1 177 785	786 711	913 116	1 473 445	2 090 901
Off-mine-site (3)	477 850	819 047	123 313	222 212	601 163	1 041 259	n.a.	n.a.	601 163	1 041 259
On-mine-site (3)	60 203	84 431	25 370	52 095	85 572	136 526	786 711	913 116	872 283	1 049 642
Capital (4)	5 545	17 646	16 719	172 366	22 265	190 012	1 015 268	1 804 592	1 037 532	1 994 604
$ for environmental protection and restoration (5)	513	675	269	415	782	1 090	34 305	49 392	35 087	50 482
Total	543 598	921 123	165 402	446 673	709 000	1 367 797	1 801 978	2 717 708	2 510 978	4 085 504
Repair and maintenance (4)	5 892	8 014	26 681	50 953	32 573	58 967	1 440 679	1 641 234	1 473 252	1 700 202
$ for environmental protection and restoration (5)	10	593	205	348	215	941	16 332	28 029	16 546	28 970
Grand total	549 490	929 137	192 083	497 627	741 573	1 426 764	3 242 657	4 358 942	3 984 230	5 785 706
Total environment	3 201	8 990	15 578	20 497	18 779	29 487	124 119	154 067	142 899	183 553
Environment as a percentage of grand total	0.6	1.0	8.1	4.1	2.5	2.1	3.8	3.5	3.6	3.2

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes on-mine-site plus off-mine-site activities; exploration and deposit appraisal activities include only the search for and appraisal of deposits and do not include work for extensions of known reserves. (2) Overhead expenditures include mineral leases and claims, and project-related head office expenditures. (3) Amount of exploration and deposit appraisal expenditures dedicated to off-mine-site and on-mine-site activities. (4) Includes construction, and machinery and equipment expenditures. (5) As part of capital expenditures or repair and maintenance expenditures.
Notes: Numbers may not add to totals due to rounding. Data for 2003 and 2004 are final.

expenditures, approximately 81% of the $274 million recorded for off- and on-mine-site deposit appraisal activities in 2004 was reported as off-mine-site spending. This proportion is in line with those of the post-1997/98 era and continues to indicate a relative lack of advanced work on mining properties.

A provincial/territorial breakdown of exploration and deposit appraisal expenditures reveals that virtually all recorded spending in 2004 in Manitoba and New Brunswick was reported as exploration-phase work (**Figure 6**). Nunavut (94%), the Yukon (91%), and Nova Scotia (90%) also recorded very high proportions of exploration-related work. In fact, with the exception of the Northwest Territories and Alberta, all Canadian mining jurisdictions experienced a domination of exploration-type work over deposit appraisal activities. While this has to be expected to a certain extent, since not all exploration projects graduate to the deposit appraisal stage, there appears to be a continued lack of advanced projects undergoing development.

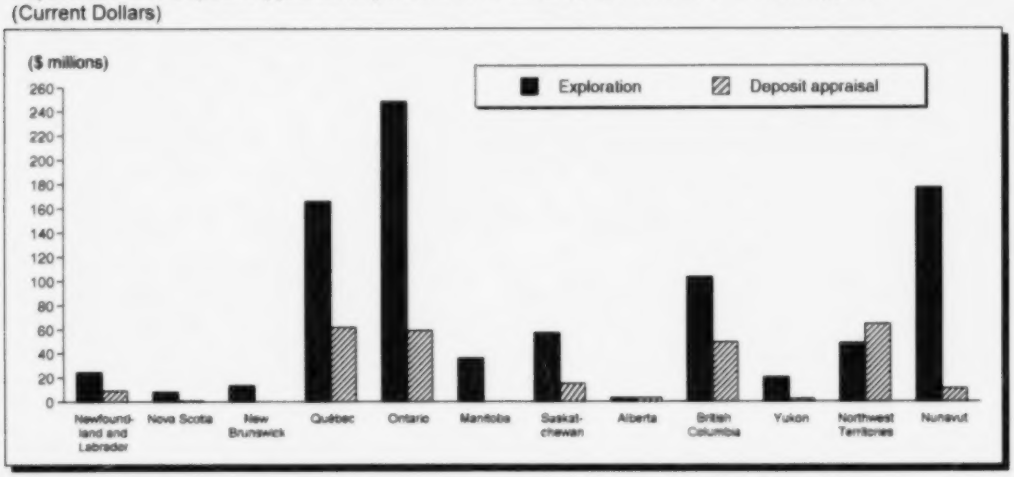
For yet another year, the advanced stage of some diamond projects in the Northwest Territories is reflected in the high proportion of deposit appraisal spending in that territory. In 2004, 57% ($64 million) of all exploration and deposit appraisal expenditures in the Northwest Territories was incurred for deposit appraisal activities. Other leaders on the deposit appraisal scene, in dollar terms, included Québec ($61 million), Ontario ($59 million) and British Columbia ($49 million). In all three of these provinces, the deposit appraisal spending is attributable to a number of different projects.

In terms of ranking by total exploration expenditures, Ontario was far ahead of the other provinces/territories with $248 million, compared to Nunavut's $177 million, Québec's $166 million and British Columbia's $103 million. Together these four jurisdictions accounted for 77% of all exploration-phase expenditures in Canada in 2004.

1.3.1.3 Spending by Type of Activity

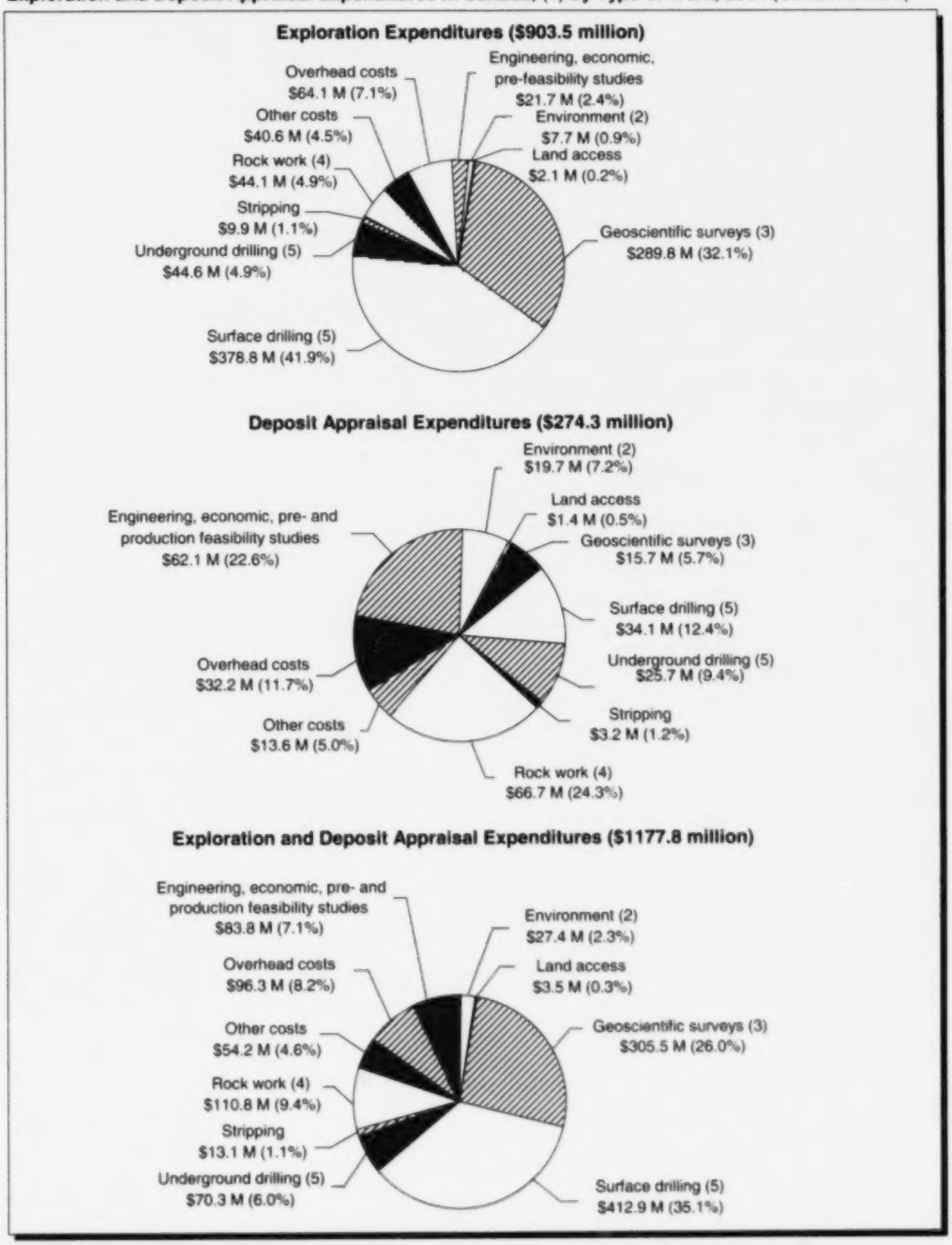
A detailed cost breakdown for each of the exploration and deposit appraisal work phases shows that drilling (surface and underground) is the most important cost component in the discovery and delineation of a mineral deposit (**Figure 7**). In 2004, surface and underground drilling (diamond drilling

Figure 6
Exploration and Deposit Appraisal Expenditures in Canada, by Province and Territory, 2004
(Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Data for 2004 are final.

Figure 7
Exploration and Deposit Appraisal Expenditures in Canada, (1) by Type of Work, 2004 (Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes on-mine-site and off-mine-site activities. (2) Environment includes characterization, permitting, protection, monitoring and restoration. (3) Geoscientific surveys include geology, geochemistry, ground geophysics and airborne geophysics. (4) Rock work activity includes shaft work, drifts, cross-cuts, raises, declines, rock sampling and dewatering costs. (5) Surface and underground drilling includes diamond and other types of drilling.
Notes: Numbers may not add to totals due to rounding. Data for 2004 are final.

and other types of drilling) accounted for 47% ($423 million) of the $904 million spent on the exploration work phase. As can be expected, surface drilling represented the vast majority of exploration-related drilling activity. In fact, 89% of the $423 million spent on drilling was alloted to surface drilling projects. Evidently, geoscientific surveys (geology, geochemistry and geophysics) also represent a very important cost component in that work phase. In 2004, 32% ($290 million) of all exploration-phase spending was recorded under the geoscientific surveys cost category.

In the deposit appraisal phase, surface and underground drilling accounted for 22% ($60 million) of the total $274 million spent in 2004, immediately behind the cost category encompassing engineering, economic and feasibility studies, which accounted for 23% ($62 million).

Overall, surface and underground drilling accounted for 41% ($483 million) of all exploration and deposit appraisal spending in 2004 while geoscientific surveys ranked second with 26% ($306 million).

Among the other cost categories included in the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures, those of environment and land access can be of particular interest. For instance, these statistics may be useful for non-governmental organizations interested in monitoring mineral development activity, for mining stakeholders in presenting their case for improvements to the tax treatment of their industry, for Aboriginal communities in planning the use of their lands, and for governments in developing mining-related policies.

When reading the following analysis on environmental and land access spending, the reader should know that these costs may be underestimated.

In 1997, a total of $47 million was recorded as environment-related expenditures (which include costs incurred for characterization, permitting, protection, monitoring and restoration), or 5.1% of all exploration and deposit appraisal expenditures for that year. This percentage remained almost the same in 1998 (4.9%) as a total of $32 million was directed at environment-related expenditures. It declined to 3.8% ($19 million) in 1999, 2.0% ($10 million) in 2000, and to only 1.6% ($8 million) in 2001. Environment-related expenditures rebounded in 2002 when they represented 3.5% ($20 million) of total expenditures. In 2003, $18 million, or 2.6% of total exploration and deposit appraisal expenditures for that year ($687 million), was spent on environment-related items, a proportion slightly higher than the 2.3% ($27 million) recorded in the following year (**Table 4**). As can be expected, most of the $27 million incurred for environment-related work in 2004 was invested in the deposit appraisal stage as environment-related expenditures tend to become more substantial as a project advances towards the mine construction stage. For instance, environment-related costs represented the second highest cost category (when capital, repair and maintenance costs are excluded) in the mine complex development work phase in 2004. These costs amounted to $77 million or 8.4% of the $913 million that was spent on the last work stage before actual mine production.

Similar to environmental costs, land access costs (which include costs incurred for impact and benefits and socio-economic agreements, rights of way, damages and permits) only account for a small fraction of total exploration and deposit appraisal expenditures. In recent years, these costs have typically ranged between about 0.5% and 1.5% of total exploration and deposit appraisal spending. In 2004, only $3.5 million was recorded as land access expenditures, an amount that represents only 0.3% of total exploration and deposit appraisal spending for that year. These same costs accounted for $11 million (1.2%) of mine complex development expenditures. Beyond that stage and into mine production, both environment and land access costs increase substantially as items such as impact and benefits agreements, the adoption of more stringent effluents and emissions regulations, and the enviromental restoration of disturbed sites come into play.

Expenditures for economic, engineering and feasibility studies are more substantial than those for the environment and land access. In aggregate, these costs represented 5.2% ($48 million) of total

exploration and deposit appraisal expenditures in 1997, 6.8% ($45 million) in 1998, 8.0% ($41 million) in 1999, 5.0% ($25 million) in 2000 and 5.6% ($29 million) in 2001. This type of spending almost doubled in 2002 when $54 million, or 9.3% of total spending, was dedicated to such studies and remained close to that level in 2003 with expenditures of $50 million (7.3% of the $687 million total). In 2004, a total of $84 million was recorded under that heading, representing 7.1% of total exploration and deposit appraisal spending for that year. Once again, this type of expenditure was incurred more at the deposit appraisal stage.

1.3.1.4 Spending by Type of Company

The analyses within this report often distinguish between senior and junior companies. In general terms, a senior company derives its income from mining or other business ventures and can direct part of that income towards its exploration and deposit appraisal projects. Junior companies, on the other hand, usually have no regular source of income and must finance their projects through the issuance of shares.

In 2004, 112 senior project operators accounted for 49% ($578 million) of all exploration and deposit appraisal expenditures in Canada (**Figures 1** and **2**). About two-thirds of total senior spending was allocated to exploration activities with the remaining third going to deposit appraisal work (**Figure 5**). At 96, the number of senior project operators was lower in 2003 but their proportion of total spending was higher. These 96 senior project operators reported 59% ($403 million) of total spending for that year. The distribution of senior project operators by range of spending was once again skewed towards the higher spending intervals in 2004 with 48 projects recording expenditures above the $1 million level and 16 of these falling in the more than $10 million range (**Table 1**). In fact, these 16 projects averaged an impressive $26.3 million per project. While projects are not tracked on an individual basis in this analysis, the recent shift towards higher spending per project is likely both an indication of successful exploration and deposit appraisal work warranting further investigation and the pressing need for senior companies to find new sources of ore reserves to benefit from the currently favourable metal price outlook.

About 78% ($452 million) of the expenditures reported by senior firms in 2004 were incurred in Ontario, Québec, Nunavut and the Northwest Territories (in decreasing order) (**Figure 2**). Québec recorded the largest year-over-year increase with a gain of $52 million while the Northwest Territories (+$34 million), British Columbia (+$19 million) and Ontario (+$18 million) also saw senior companies raise their spending by significant amounts in their respective territories.

The number of junior project operators jumped to 602 in 2004 from 555 in 2003, an increase of 10%; this was the first time that junior companies numbered more than 600 in the 1997-2004 period (**Figure 1** and **Table 1**). This total also exceeds by 178 companies the trough of 2000 when only 424 juniors had incurred exploration and deposit appraisal spending. Altogether, these junior companies and prospectors spent $600 million on exploration and deposit appraisal in 2004, more than double the $284 million they spent in 2003. This huge improvement in junior company spending comes on the heels of another major gain of 49% between 2002 and 2003, and three more moderate yearly increases from 1999 to 2002. Even when accounting for the time value of money, junior company exploration and deposit appraisal expenditures have almost tripled since 1999. This rising trend in junior spending coincides with vastly improved metal market conditions and with the availability of federal and provincial/territorial incentives aimed precisely at encouraging the type of exploration work that junior companies specialize in, i.e., surface grass-roots exploration.

Every mining province/territory experienced an increase in junior company spending in 2004. In dollar terms, junior spending increased the most in British Columbia (+$70 million), Ontario (+$70 million), Nunavut (+$59 million) and Québec (+$41 million). Ontario recorded the largest amount of junior spending in 2004 with $141 million, followed by British Columbia ($116 million), Nunavut ($108 million) and Québec ($90 million) (**Figure 2**). These four jurisdictions accounted for 76% of all junior spending in Canada in 2004.

In 2004, junior company spending most frequently fell in the $1 million-$5 million and the $200 000-$500 000 spending intervals (**Table 1**). Companies spending less than $50 000 are not considered here as their average spending of less than $20 000 does not translate into many significant exploration projects. There were substantial increases in the number of junior companies falling into the spending intervals situated above the $500 000 mark. Gains amounting to 6 companies spending more than $10 million, 14 companies spending between $5 million and $10 million, and 45 companies spending between $1 million and $5 million are particularly impressive. With an average investment of $1 million per project in 2004, the 602 junior companies and prospectors that managed mineral exploration projects in Canada did not only contribute to the future prosperity of the Canadian mining industry, but also created jobs and business opportunities in many remote regions of the country.

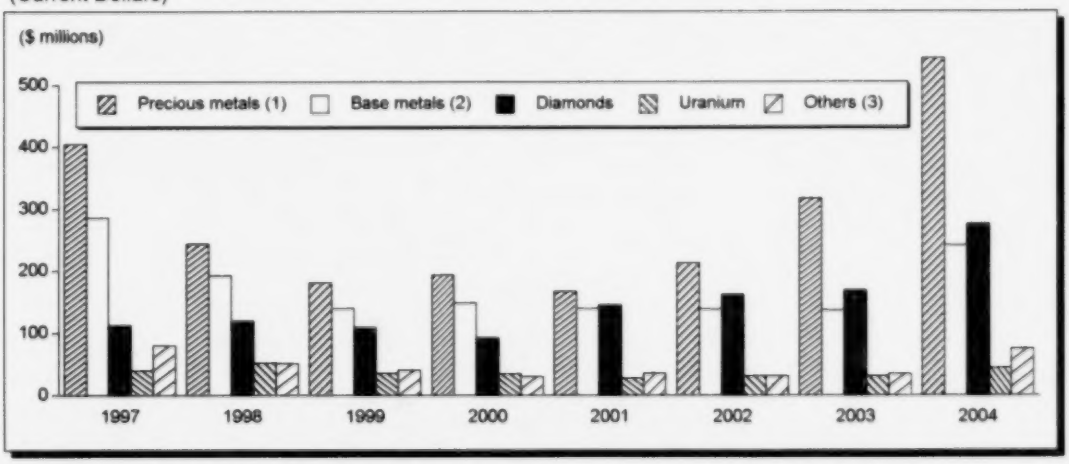
1.3.1.5 Spending by Type of Commodity Sought

The survey provides a breakdown of exploration and deposit appraisal spending statistics by type of commodity sought. **Figure 8** shows such a breakdown for the groups of commodities or individual commodities most explored for in Canada: precious metals, base metals, diamonds, uranium and "others."

As a result of declining prices, exploration and deposit appraisal spending for precious metals (mostly gold) and base metals decreased significantly between 1997 and 2001. Precious-metals spending dropped from $405 million in 1997 ($464 million in constant 2004 dollars) to $167 million (constant $179 million) in 2001 while base-metal spending decreased from $286 million (constant $328 million) to $139 million (constant $150 million) over the same period.

In 2002, precious-metals expenditures recovered somewhat by increasing to $213 million (constant $226 million), a 27% increase compared to the 2001 level but still far below the 1997 total of $405 million (constant $464 million). In response to an improving gold price outlook, precious-metals spending increased drastically in 2003 to reach $316 million (constant $326 million), an

Figure 8
Exploration and Deposit Appraisal Expenditures in Canada, by Commodity Sought, 1997-2004
(Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes gold, silver and platinum group metals. (2) Includes copper, nickel, lead and zinc. (3) Includes ferrous metals, other metals, nonmetals (including coal), and "not specified."
Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Data for 2004 are final.

increase of 49% over the previous year. The outlook continued to brighten in 2004 and the search for gold and other precious metals intensified even more with a strong 72% increase (to $543 million) in the amounts dedicated to their discovery.

Because complete statistics on commodities sought are collected in the *Actual* survey rather than the *Preliminary* or *Spending Intentions* surveys, no firm data are available yet for 2005. As a result, a spending-by-commodity-sought analysis for 2005 will not be presented in this report. Nevertheless, with a gold market that continues to be favourable, there are indications that this precious metal will be, once again, the top exploration target in Canada and that base metals and diamonds will still be competing for second place. All three of these commodity groups should experience spending increases in 2005. Uranium also appears to be headed for a strong year.

The base-metals commodity group, which used to rank second behind precious metals, finally showed signs of recovery in 2004 despite finishing third behind diamonds. After falling by over 50% between 1997 and 1999, base-metals exploration and deposit appraisal expenditures remained relatively constant in the ensuing years until 2004 when they increased by 76% to $241 million. In this case also, the favourable market context could lead to increased spending in 2005 and that would be a very desirable outcome given the sad state of Canadian base-metal reserves and the desperate situation of some mines and smelters.

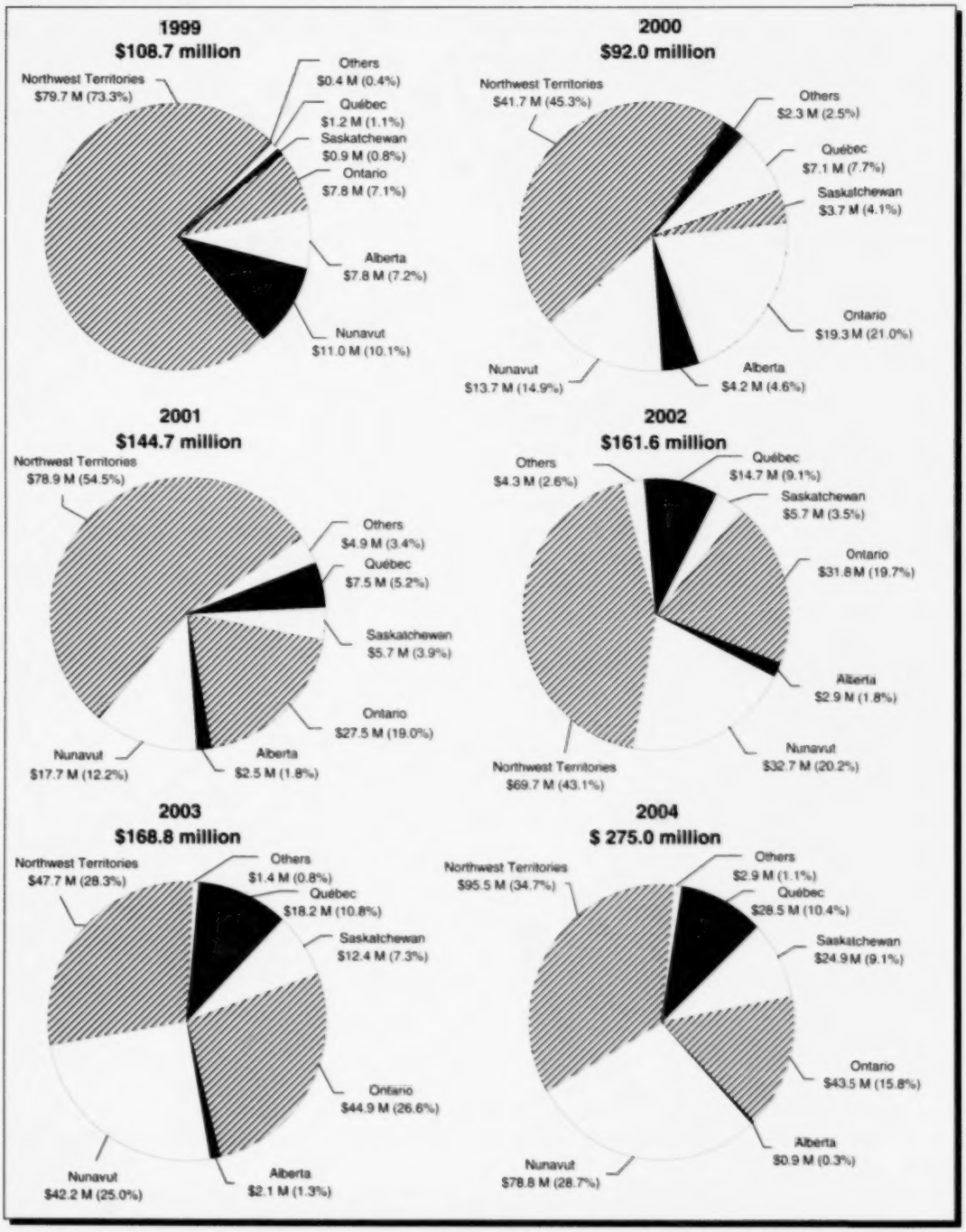
For the fourth year in a row, the search for diamonds outpaced that for base metals in 2004 with expenditures of $275 million. Since diamond exploration took off in earnest in Canada (back in 1993), over $2 billion (in constant 2004 dollars and including only field and overhead expenditures for the years prior to 1997) has been invested in exploration and deposit appraisal activities aimed at discovering these precious gems in Canada. Considerably more has been invested in mine complex development activities and this sector continues to generate news from many areas across the country and in all stages of the mineral development cycle (**Table 29**, Appendix 2).

In 2004, the Northwest Territories was once again the principal recipient of the funds destined for diamond exploration and deposit appraisal activity in Canada as $96 million was spent in that territory (**Figure 9**). Nunavut ($79 million), Ontario ($44 million), Québec ($29 million) and Saskatchewan ($25 million) also recorded significant levels of diamond-related expenditures, proving once again that Canada's diamond potential is geographically widespread. For more information on the projects responsible for these expenditures, as well as short-term mine development plans, the reader is invited to consult the provincial/territorial reviews that are featured in the next chapter of this report.

Table 5 combines information on both the types of companies conducting exploration and deposit appraisal activities and the types of commodities sought by these companies. In 2001, diamonds were the senior companies' favourite target with spending of $106 million. Base metals were second with $95 million and precious metals, reflecting an unattractive gold price, came in third with $90 million. Senior companies adjusted their spending priorities in 2002 as $122 million was spent on the search for precious metals, followed by diamonds with $120 million and base metals with $99 million. Their priorities were reaffirmed in 2003 when senior companies responded favourably to the gold price outlook and increased their spending on that commodity group to $172 million, a 41% increase over the 2002 level. Diamonds remained their second choice with spending of $106 million and base metals were again relegated to third place with expenditures of $81 million.

As could be expected from the huge overall increase in spending that took place in 2004, expenditures rose across all commodity groups. For senior companies, this was more evident, in percentage terms, in the case of diamonds, ferrous metals and coal. However, the precious-metal and base-metal groups also benefited from robust, albeit almost similar, percentage increases in spending. These increases in commodity group spending resulted in precious metals ($235 million) outranking diamonds ($169 million) and base metals ($112 million) as the favourite exploration and deposit appraisal target of senior companies.

Figure 9
Diamond Exploration and Deposit Appraisal Expenditures in Canada, by Province and Territory, 1999-2004 (Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.

Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Numbers may not add to totals due to rounding. Data for 2004 are final.

TABLE 5. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES IN CANADA, (1) BY TYPE OF COMPANY AND MINERAL COMMODITY, 2002-04 (Current Dollars)

Type of Company	Base Metals	Precious Metals	Uranium	Diamonds	Others (2)	Total
			($000)			
2002						
Junior companies and prospectors	40 087	91 126	1 837	41 726	16 017	190 793
Senior companies	98 761	121 671	28 234	119 918	14 044	382 628
Total	138 848	212 797	30 071	161 645	30 060	573 421
2003						
Junior companies and prospectors	55 796	144 269	2 391	62 558	18 674	283 688
Senior companies	81 204	172 144	28 389	106 256	15 054	403 047
Total	136 999	316 413	30 781	168 815	33 727	686 735
2004						
Junior companies and prospectors	128 942	308 205	10 727	107 082	44 762	599 718
Senior companies	112 333	234 734	33 104	167 887	30 009	578 067
Total	241 275	542 940	43 831	274 969	74 771	1 177 785

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site costs incurred for field work and overhead, plus engineering, economic and feasibility studies, environment and land access costs. (2) Includes iron, other metals, coal and other
Notes: Numbers may not add to totals due to rounding. Data for 2004 are final.

As for junior companies and prospectors, they continued to show a marked preference for precious-metals exploration throughout the period 2001-04. Their steadily increasing expenditures on the search for gold and platinum group metals (PGMs) more than doubled in 2004 to reach $308 million, more than four times the $76 million ($82 million in constant 2004 dollars) spent in 2001. Surprisingly, junior companies spent more on the search for base metals in 2004 than they did for diamonds. The $129 million that was incurred as base-metal exploration expenses amounted to 131% more than what they had disbursed in the previous year, while their diamond expenditures increased by 71% to $107 million. The importance of the junior sector was highlighted by the fact that junior companies spent more than senior companies on all commodity groups except uranium, diamonds and coal in 2004.

1.3.2 2005 Exploration and Deposit Appraisal Expenditures

1.3.2.1 Statistical Summary

As explained in the opening paragraphs of this chapter, company spending intentions for 2005 were compiled in January 2005 and revised in September of the same year. While this approach yields more timely forecasts of exploration and deposit appraisal expenditures, it also results in a less detailed forecast survey exercise. For instance, data on spending by type of commodity and by type of work are not exhaustive enough in the 2005 revised forecast results to be presented in this report. Rather, they will be available in the 2006 edition after results from the final survey have been released later in 2006.

Company spending intentions, compiled in January 2005 and revised in September 2005, reveal that 706 companies (project operators) and some prospectors intended to spend even more than they did in 2004 with revised spending intentions of $1369 million (**Figures 1** and **2**). This total is the greatest recorded since the heyday of the Mining Exploration Depletion Allowance in 1987 and 1988. In constant 2004 dollars, 1987 expenditures had amounted to $1892 million and 1988 spending to $1879 million. While the final amount of exploration and deposit appraisal spending will be confirmed in the *Actual* survey, it can already be said that 2005 has been a banner year for mineral exploration in Canada. It will be interesting to see what concrete results, in terms of discoveries and advancing projects towards production, will come out of this tremendous exploration effort and how this will benefit the future outlook of the Canadian mining industry.

The total of 706 project operators represents a small decrease (-1.1%) from the 2004 total of 714 companies (expenditures of $1178 million). Under the current upward trend in exploration and deposit appraisal spending, it is difficult to say whether or not the number of project operators has now somewhat stabilized or if there is still room for more companies to enter the market. However, given the fact that the financing of junior company activities might become more difficult because of the phasing out of the federal Investment Tax Credit for Exploration at the end of 2005, it is likely that the number of industry participants has reached, or is close to reaching, a plateau. In addition, there are indications that the exploration and deposit appraisal industry has decided to increasingly focus its efforts on a manageable number of projects as 2005 spending amounts to $1.9 million per project, compared to $1.6 million in 2004, $1.1 million in 2003 and $1.0 million in 2002. This increase in spending per project has taken place in an environment conditioned by strong metal prices, interesting discoveries and exploration results, generous incentive levels, and mining-friendly capital markets. It reflects the fact that companies are not only interested in making new discoveries, but are also keen to advance their projects as far as possible under the current favourable conditions.

This commitment to serious exploration and deposit appraisal activity is highlighted by the number of higher-cost projects reported for 2005. Revised company spending intentions indicate that a total of 252 companies (187 in 2004, 115 in 2003 and 89 in 2002) each intended to spend more than $1 million in 2005 (**Table 1**). These 252 companies expected to spend a total of $1237 million, or 90% of total intended expenditures for 2005. This $1237 million total also represents a 19% increase from the $1043 million spent on projects of $1 million or more in 2004.

In addition to the increased number of projects in the $5 million-$10 millon and more-than-$10 million spending intervals, there appears to be a new generation of projects cropping up in the $1 million-$5 million range. These projects, numbering 185 in 2005, could hold some of Canada's future promising deposits. However, a sustained positive outlook will be needed to support the continued investigation of these properties.

The very large projects are owned mostly by senior companies with 15 projects averaging $27 million per project in the more-than-$10 million spending range. Junior companies manage 13 projects in that same spending interval and these average $15 million per project. Junior companies totally dominate the other spending categories, even the $5 million-$10 million and $1 million-$5 million ones. In the latter, they own 160 projects and, as just mentioned, some of them could be key to future mine development activities. Enough money has been invested in some of these projects for their junior company owners to decide whether the results obtained to date warrant expanded work programs either on their own, with partners, or through selling the asset to more financially solid entities, or, in the case of unsuccessful exploration, a suspension or refocusing of activities.

Overall, the 2005 forecast total of $1369 million is both reassuring in the sense that the upward trend in exploration and deposit appraisal expenditures continues unabated and is also worrying because of the slower rate of growth recorded from 2004 to 2005. Prices are strong across a wide range of mineral commodities and that should provide a strong impetus for continued strength in mineral exploration activity in the near future. However, it remains to be seen what impact the phasing out of the Investment Tax Credit for Exploration (ITCE) will have on flow-through-share financing by junior companies and how stock market conditions, in general, will affect the availability of mineral exploration capital. Other factors to watch for include competition for investment from properties located abroad and the speed at which Canada's top projects will advance through the regulatory approval process, as this will have a direct bearing on how investors and companies perceive their upcoming projects and the level of commitment they should apply to them.

About 55% of the total intended exploration and deposit appraisal expenditures for 2005 were reported, in decreasing order, by Ontario ($337 million), Québec ($227 million) and British Columbia ($195 million) (**Figure 2** and **Table 2**). Nunavut ($159 million), Saskatchewan ($140 million) and the Northwest Territories ($133 million) accounted for another 32% as spending

continued to increase in 8 of the 12 mining provinces/territories and stayed about the same in three others. Only Nunavut is expected to see its spending decrease (by $29 million), but this decline would follow an extremely strong showing in 2004 that saw expenditures more than double in that territory. Besides the spectacular 95% increase that took Saskatchewan from $72 million in 2004 to $140 million in 2005, the Yukon with a 147% jump (to $54 million) and Manitoba with a 46% rise (to $53 million) also stood out among those provinces/territories that traditionally rank in the middle-to-bottom range of the Canadian mineral exploration spending spectrum.

In Ontario and Québec, these high levels of spending are distributed among many projects targeting a number of commodities (precious metals, base metals and diamonds) and are also well balanced between junior and senior companies. In British Columbia, where spending is also well distributed among projects and commodities, including coal and porphyry deposits (copper and molydenum), the junior mining sector is definitely predominant. As expected, Nunavut has no on-mine-site activities. There again, the work is distributed among a number of commodity groups that include diamonds, gold and base metals, but also include other products such as iron ore and sapphires. Saskatchewan is clearly benefiting from an outstanding uranium market outlook, but diamonds and gold have also been driving expenditures in that province. In Manitoba, exploration and deposit appraisal activities have focussed on the usual base-metal and precious-metal targets, but also on diamonds and uranium. Uranium has even been a factor in the exploration revival that is taking place in the Yukon where other non-traditional commodities such as tungsten and molybdenum have joined the more traditional gold, silver, zinc and copper.

Revised company spending intentions indicate that off-mine-site exploration and deposit appraisal expenditures are expected to continue on the upward trend that began after the trough of 1999 (or 2000 when using constant 2004 dollars). In 2005, off-mine-site exploration and deposit appraisal spending is expected to increase by another 16% from the 2004 level of $1041 million and reach $1211 million (**Figure 3**). Saskatchewan (+$65 million), British Columbia (+$44 million), and the Yukon (+$32 million) will experience the most significant increases for that type of spending (**Figure 4**).

Overall, off-mine-site spending is expected to account for 88% of total exploration and deposit appraisal expenditures in 2005, a proportion that has remained relatively stable throughout the current upward trend. This concentration of spending on off-mine-site work continues to fuel concerns about the depletion of Canada's ore reserves, particularly at base-metal mines, as on-mine-site expenditures continue to lag far behind those taking place away from mine sites.

The improved prospects for mine openings, re-openings and mine expansions[4] will also have a role to play in the recovery of ore reserve levels, but the current lack of on-mine-site spending remains worrisome as some of these re-openings and expansions will occur strictly on the basis of improved economics for currently known reserves and resources and not because of additional discoveries. In addition, the strength of the Canadian dollar relative to the U.S. dollar will remain an important consideration in determining how much metal prices have really improved for Canadian producers and how much impetus they can derive from future increases in prices denominated in the U.S. currency.

Ontario ($84 million) and Québec ($45 million) are expected to account for 81% of the $159 million that is slated to be spent on mine sites in 2005. British Columbia, the Northwest Territories, Manitoba, Saskatchewan, and Newfoundland and Labrador should account for most of the remaining $30 million with expenditures ranging from $3 million to $8 million.

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[4] For a discussion on Canadian mining production plans, see Lo-Sun Jen, "Canadian Mine Openings, Closings, Expansions, Extensions and New Mine Developments" in the 2004 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa.

1.3.2.2 Spending by Work Phase

Revised company spending intentions indicate that expenditures dedicated solely to exploration activities will increase by 20% in 2005 to reach $1085 million (**Figure 5**). This amount represents 79% of total intended exploration and deposit appraisal expenditures for that year. Of this $1085 million total, $987 million (91%) will be incurred off mine sites (**Figure 3**).

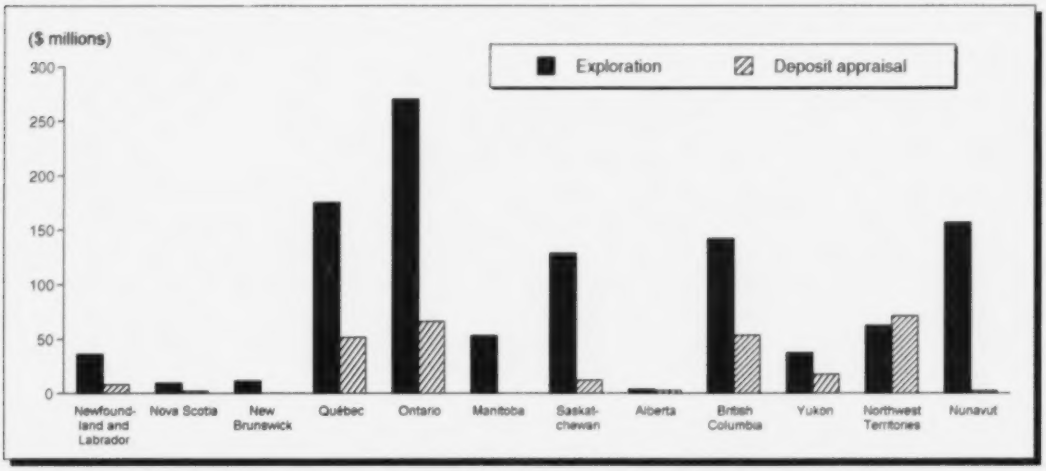
Deposit appraisal spending is expected to amount to $285 million in 2005. Of this total, $224 million (79%) will be incurred off mine sites and $61 million (21%) on mine sites. While on-mine-site deposit appraisal activities appear to be relatively low, the emphasis on off-mine-site projects may be positive if it leads to the development and opening of new mines, possibly outside of traditional mining camps.

On a provincial/territorial basis, exploration-phase expenditures are expected to surpass deposit appraisal expenditures everywhere except in the Northwest Territories (**Figure 10**). New Brunswick, Manitoba, and Nunavut are expected to have virtually all of their work recorded under the exploration category. The proportion of exploration work, out of total exploration and deposit appraisal spending, in other provinces/territories is also expected to be at least 80% in Saskatchewan, Nova Scotia, Newfoundland and Labrador, and Ontario.

In terms of ranking by total exploration-phase expenditures, Ontario is once again expected to rank first with spending of $270 million. Québec ($175 million) is expected to overtake Nunavut ($157 million) for second place. British Columbia ($141 million) and Saskatchewan ($128 million) will also be the recipients of major exploration-phase investments. Together these four provinces and one territory should contribute about 80% of total Canadian exploration-phase expenditures.

The Northwest Territories ($71 million), Ontario ($66 million), British Columbia ($53 million) and Québec ($51 million) are expected to lead the country in terms of deposit appraisal spending in 2005. The appearance of the Yukon ($17 million) in fifth place is welcome as this territory enjoyed little deposit appraisal spending in recent years.

Figure 10
Exploration and Deposit Appraisal Expenditures in Canada, by Province and Territory, 2005
(Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
Notes: Exploration and deposit appraisal expenditures include off-mine-site and on-mine-site field and overhead expenditures, plus engineering, economic and feasibility studies, environment and land access costs. Data for 2005 are based on revised company intentions compiled in September 2005.

1.3.2.3 Spending by Type of Company

Based on company spending intentions compiled in January 2005 and revised in August 2005, a total of 113 senior project operators intended to spend $579 million in 2005, accounting for 42% of all exploration and deposit appraisal expenditures for that year (**Figures 1** and **2**). In a year when overall spending is expected to increase by 16% from $1178 million in 2004 to $1369 million, senior spending will remain essentially the same as in 2004 with a forecast increase of barely $1 million. In fact, if this forecast holds true, 2005 will represent the second year in a row that junior exploration spending has exceeded spending by senior companies. In the history of Canada's mineral exploration statistics, this situation happened in only one other year, 1987, when the generous Mining Exploration Depletion Allowance combined with favourable metal prices to push exploration spending to record highs. About two thirds of total spending by senior companies in 2005 is expected to be allocated to activities falling in the exploration work phase with the remaining third going to deposit appraisal activities (**Figure 5**).

In line with stable expenditure levels, the number of senior project operators remained almost the same in 2005 as in 2004 (113 vs. 112). Still, some movement is expected in terms of project size with the loss of one senior project in the more-than-$10 million spending range and the addition of eight projects in the $5 million-$10 million and $1 million-$5 million intervals (**Table 1**). The concentration of senior company spending in higher-cost projects is not a new phenomenon. It can be explained, at least partly, by the ability of these companies to generate and mobilize the funds necessary to finance these undertakings and by their willingness to combine their efforts with junior companies, through acquisitions or joint ventures, to ensure that a certain stream of advanced projects remains available to sustain their mining and processing activities in the longer term.

More than three quarters (77%) of the expenditures intended by senior firms for 2005 were destined for Ontario, Québec, Nunavut and Saskatchewan (in decreasing order) (**Figure 2**). The largest decline in senior spending in 2005 is expected in Nunavut (-$42 million). However, some of that lost senior spending will be shifted to the junior side as a number of projects in Nunavut are operated by junior companies with senior companies as partners. Increases in senior spending in Ontario (+$24 million), Saskatchewan (+$17 million) and Manitoba (+$10 million) will mostly counter the combined decreases to be recorded in Nunavut, Québec, New Brunswick and the Yukon.

The number of junior project operators (including prospectors) was expected to total 593 in 2005, compared to 602 in 2004. Standing at around 600 for the second year in a row, the number of junior project operators could be at or near a peak after a period of growth that saw this number increase from 424 in 2000 (**Figure 1**). The small decrease in the number of junior project operators in 2005 will be accompanied by a strong rise of $191 million (+32%) in junior company spending (**Figure 5**). This increase comes on the heels of five successive years of growth and, most particularly, maintains the momentum created by gains of 49% and 111% in 2003 and 2004. Riding this upward trend, total intended junior company spending is expected to reach $790 million in 2005. This total is by far the highest recorded for junior company spending (in both current and constant 2004 dollars) since the survey was redesigned in 1997. Notwithstanding the differences in surveying methodologies between the old and the new survey, this total is also the highest since the all-time highs that were reached during the heyday of the Mining Exploration Depletion Allowance back in the 1986-88 period.

As can be expected, an increase of this magnitude will be felt throughout most of the country. In fact, every mining jurisdiction in Canada, with the exception of Alberta, is expected to experience a rise in junior company spending in 2005 (**Figure 2**). The largest increases, in dollar terms, should occur in Saskatchewan (+$51 million), British Columbia (+$42 million) and the Yukon ($33 million). In decreasing order of expenditures, British Columbia, Ontario, Nunavut and Québec as a group are expected to account for 67% of all junior company expenditures in Canada in 2005.

The upward trend in junior company spending was accompanied by a corresponding rise in the average size of their projects, as shown by a breakdown of junior exploration and deposit appraisal expenditures by range of spending (**Table 1**). When not counting projects under the $50 000 level, junior companies typically spent $100 000 to $500 000 per project in both 2001 and 2002. In 2003, the bulk of junior company projects still amounted to $500 000 or less, but projects with higher spending ($500 000 or more) now numbered 133, equal to the total of the previous two years in the same spending intervals. The 2004 data reveal a marked preference for projects ranging from $200 000 to $5 million and, for the first time since 2001, some junior company projects (6) received more than $10 million in expenditures. For 2005, revised spending intentions show that most junior company projects were, once again, expected to fall in the $500 000 to more-than-$10 million range. The shift towards higher-cost projects was even more evident in the number of projects worth from $5 million to $10 million (24 projects) and in those worth more than $10 million (13 projects), thus attesting to the presence of junior companies in some of the largest exploration undertakings in the country. Overall, average spending per junior company project will have gone from $401 000 in 2001 to $1 333 000 in 2005.

As previously mentioned, junior company expenditures are poised to exceed those by senior companies for the second year in a row. This newfound strength in junior company spending is a reflection of their ability to rapidly mobilize resources in the presence of favourable financing conditions (brought about by a positive metals market outlook) and the availability of measures to encourage grass-roots-type (or off-mine-site) exploration. In this positive environment, junior companies have also been able to benefit from associations with senior companies to provide funds, knowledge and expertise in the joint exploration of promising properties.

The contribution of government incentives to the current rejuvenation of the Canadian junior mining sector clearly coincides with the rising trend in junior company spending. Incentives like the federal Investment Tax Credit for Exploration (ITCE), which was introduced in October 2000 and is linked to the use of flow-through shares, as well as a number of harmonized and non-harmonized provincial/territorial measures, were specifically designed to meet the needs of the junior mining sector and encourage grass-roots-type exploration work (see the Regional Outlook section for more details on provincial/territorial incentive measures).

In fact, evidence gathered by an Intergovernmental Working Group on the Mineral Industry (IGWG) sub-working group on taxation, and submitted to the 2003, 2004 and 2005 Mines Ministers' Conferences in Halifax (Nova Scotia),[5] Iqaluit (Nunavut),[6] and St. Andrews (New Brunswick),[7] strongly suggests that most of the junior company spending recorded in Canada since 2000 has indeed been financed through the issuance of flow-through shares. Data collected by Natural Resources Canada for the period ranging from October 2000 (date of introduction of the ITCE) to the end of September 2005 reveal that flow-through-share funds totaling more than $1.4 billion had been raised by the industry to finance mineral exploration projects in Canada. Furthermore, this total does not even include the last three months of 2005 which, based on historical trends for exploration financing, will also most likely turn out to be productive in terms of flow-through-share financing.

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[5] Intergovernmental Working Group on the Mineral Industry, *Taxation Issues Relating to Exploration and the Restructuring of Resource Taxation*, Canadian Mines Ministers' Conference, Halifax, Nova Scotia, September 2003.

[6] Intergovernmental Working Group on the Mineral Industry, *Taxation Issues for the Mining Industry - 2004 Update*, Canadian Mines Ministers' Conference, Iqaluit, Nunavut, July 2004.

[7] Intergovernmental Working Group on the Mineral Industry, *Taxation Issues for the Mining Industry - 2005 Update*, Canadian Mines Ministers' Conference, St. Andrews, New Brunswick, September 2005.

Introduced as a temporary measure to counter one of the most drastic declines in the history of Canadian mineral exploration, the ITCE was extended twice in the federal budgets of 2003 and 2004. It finally expired at the end of 2005, although issuing corporations still have until the end of 2006 to incur exploration expenses with funds that were raised before the end of the program. The removal of this federal tax credit will likely have an impact on some of the harmonized provincial measures. Within this context, it is possible that junior company financing will be affected in 2006 and beyond. However, under the current market conditions and intensity of the exploration effort, it remains difficult to predict how the major driver of Canadian exploration and deposit appraisal that is the junior company sector will react to this change.

1.4 DRILLING

Drilling activities are an essential component of the mineral development cycle from the anomaly investigation stage to the deposit delineation and deposit definition stages. As such, drilling statistics constitute a valuable indicator of recent levels of Canadian mineral exploration and deposit appraisal activity.

Diamond drilling is the most widely used drilling method for determining the existence, location, extent, grade and tonnage of a mineral deposit. This type of drilling figures in most of the following analysis although, in some cases, other types of drilling are also considered. The data are from the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures and include all metres (m) drilled and expenditures reported by companies for their "own account" (drilling they did themselves) and for contracted drilling work. Data for 2005 will only be available once the *Actual* survey is compiled later in 2006.

1.4.1 Drilling by Work Phase

According to the federal-provincial/territorial survey, a total of 3 557 000 m of surface and underground drilling (including diamond drilling and other drilling methods) was carried out for exploration and deposit appraisal purposes in Canada in 2004, compared to 2 553 000 m in 2003 (**Tables 6** and **7**). Of this total, 3 470 000 m was accounted for by diamond drilling, up by 39% from the 2 492 000 m drilled in 2003. The best diamond drilling years in the 1985-2004 period occured in 1987 and 1988 (with the help of the Mining Exploration Depletion Allowance), in 1989 and 1990 (with the help of the Canadian Exploration Incentive Program), and in 1996 and 1997 (when the interest generated by the Voisey's Bay nickel-copper-cobalt deposit in Newfoundland and Labrador and by diamond discoveries in the North resulted in increased activity in these regions and elsewhere). The 2004 total for diamond drilling matches that of 1997 and, with exploration and deposit appraisal spending expected to increase even further in 2005, drilling for that year should come close to some of the best levels recorded since 1985, outside of those posted in the height of the MEDA period.

Reflecting the continued focus on grass-roots and off-mine-site types of work, some 85% (3 026 400 m) of total drilling activity in 2004 was dedicated to the exploration phase while the remaining 15% (530 400 m) was dedicated to deposit appraisal work (**Table 8**). In terms of provincial/territorial rankings, Ontario dominated exploration-phase drilling with 42% of the total metres drilled for that year while Québec and British Columbia combined for another 36%. On the deposit appraisal side, Québec, Ontario and British Columbia accounted for 88% of all drilling in that work phase.

1.4.2 Drilling by Type of Company

In 2004, senior companies accounted for 54% (1 913 700 m) of all surface and underground drilling (including diamond drilling and other drilling methods) in the exploration and deposit appraisal phases (**Table 8**). In 2003, that proportion had been 65% and in 2002, 70%. Hence, as they did for spending in 2005, junior companies could also be on the verge of overtaking senior companies in the drilling category.

TABLE 6. SURFACE AND UNDERGROUND EXPLORATION AND DEPOSIT APPRAISAL DRILLING IN CANADA, (1) BY PROVINCE AND TERRITORY, 2003 AND 2004

Province/Territory	Surface Drilling			Underground Drilling			Total Drilling		
	Exploration	Deposit Appraisal	Total	Exploration	Deposit Appraisal	Total	Exploration	Deposit Appraisal	Total
	(000 m)								
2003									
Newfoundland and Labrador	42.6	12.0	54.5	–	–	–	42.6	12.0	54.5
Nova Scotia	11.3	0.1	11.4	1.6	–	1.6	12.9	0.1	13.0
New Brunswick	9.2	–	9.2	–	–	–	9.2	–	9.2
Québec	394.5	51.1	445.6	–	81.0	81.0	394.5	132.1	526.6
Ontario	810.0	33.3	843.3	72.4	87.2	159.6	882.4	120.5	1 002.9
Manitoba	75.4	0.2	75.5	228.7	–	228.7	304.1	0.2	304.3
Saskatchewan	97.8	1.1	99.0	64.7	–	64.7	162.5	1.1	163.7
Alberta	7.9	13.6	21.5	22.6	–	22.6	30.5	13.6	44.1
British Columbia	208.2	45.6	253.8	–	0.5	0.5	208.2	46.1	254.3
Yukon	16.0	–	16.0	7.4	–	7.4	23.4	–	23.4
Northwest Territories	25.5	9.4	34.9	0.3	–	0.3	25.8	9.4	35.2
Nunavut	101.3	20.0	121.4	–	–	–	101.3	20.0	121.4
Total	1 799.7	186.4	1 986.1	397.7	168.7	566.4	2 197.4	355.2	2 552.5
2004									
Newfoundland and Labrador	66.0	30.9	96.8	2.0	0.3	2.3	68.0	31.1	99.1
Nova Scotia	20.5	2.9	23.4	2.7	–	2.7	23.2	2.9	26.1
New Brunswick	33.6	–	33.6	–	–	–	33.6	–	33.6
Québec	610.3	35.8	646.1	53.5	175.7	229.2	663.8	211.5	875.3
Ontario	872.7	16.9	889.5	386.2	122.5	508.6	1 258.8	139.3	1 398.1
Manitoba	88.9	–	88.9	22.3	–	22.3	111.1	–	111.1
Saskatchewan	173.1	–	173.1	–	1.2	1.2	173.1	1.2	174.4
Alberta	3.0	6.4	9.3	–	–	–	3.0	6.4	9.3
British Columbia	374.7	94.5	469.2	41.6	22.3	63.8	416.3	116.7	533.0
Yukon	29.4	1.8	31.2	–	–	–	29.4	1.8	31.2
Northwest Territories	52.4	10.1	62.5	–	1.0	1.0	52.4	11.1	63.5
Nunavut	192.5	8.4	201.0	1.0	–	1.0	193.5	8.4	202.0
Total	2 517.2	207.4	2 724.6	509.2	322.9	832.2	3 026.4	530.4	3 556.8

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
– Nil.
(1) Includes diamond drilling and other drilling methods such as rotary and percussion.
Note: Numbers may not add to totals due to rounding.

TABLE 7. SURFACE AND UNDERGROUND EXPLORATION AND DEPOSIT APPRAISAL DRILLING IN CANADA, 1985-2004

Year	Diamond Drilling			Other Drilling (1)		
	Metres Drilled			Metres Drilled		
	Exploration	Deposit Appraisal	Total	Exploration	Deposit Appraisal	Total
			(000 m)			
1985	..	..	2 531	..	..	270
1986	..	..	3 616	..	..	55
1987	..	..	6 221	..	..	262
1988	..	..	6 206	..	..	211
1989	..	..	3 940	..	..	297
1990	..	..	3 702	..	..	241
1991	..	..	2 341	..	..	234
1992	..	..	1 889	..	..	139
1993	..	..	1 932	..	..	262
1994	..	..	2 626	..	..	213
1995	..	..	2 993	..	..	280
1996	..	..	3 898	..	..	169
1997 (a)	2 670	734	3 404	157	239	396
1998	2 024	433	2 458	58	82	140
1999	1 693	583	2 277	62	127	189
2000	1 490	559	2 049	22	9	31
2001	1 359	321	1 679	83	4	87
2002	1 830	476	2 306	99	13	112
2003	2 165	327	2 492	33	28	61
2004	2 977	493	3 470	49	38	87

Source : Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
.. Not available.
(a) The exploration and deposit appraisal phases were adopted as part of the survey redesign in 1997.
(1) Other drilling methods include reverse circulation, rotary and percussion.

TABLE 8. SURFACE AND UNDERGROUND EXPLORATION AND DEPOSIT APPRAISAL DRILLING (1) IN CANADA, BY TYPE OF COMPANY, 2003 AND 2004

Type of Company	Exploration Drilling	Deposit Appraisal Drilling	Total by Type of Company
		(000 m)	
2003			
Junior companies			
Surface	809.4	63.3	872.7
Underground	7.7	2.5	10.2
Subtotal	817.1	65.8	882.9
Senior companies			
Surface	990.3	123.1	1 113.4
Underground	390.0	166.2	556.2
Subtotal	1 380.3	289.4	1 669.7
Total	2 197.4	355.2	2 552.5
2004			
Junior companies			
Surface	1 456.6	93.8	1 550.3
Underground	71.4	21.4	92.8
Subtotal	1 528.0	115.2	1 643.1
Senior companies			
Surface	1 060.6	113.7	1 174.3
Underground	437.8	301.6	739.4
Subtotal	1 498.4	415.2	1 913.7
Total	3 026.4	530.4	3 556.8

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes diamond drilling and other drilling methods such as rotary and percussion.
Note: Numbers may not add to totals due to rounding.

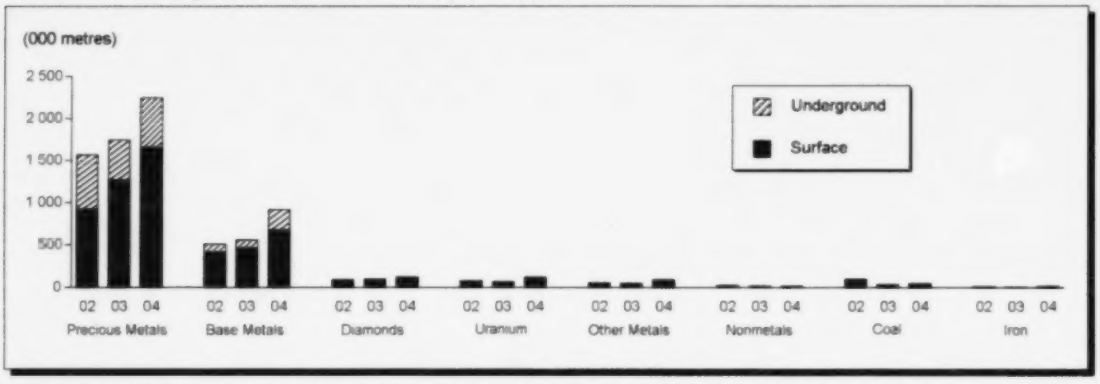
In terms of surface and underground drilling, senior companies once again accounted for the majority (89%) of the underground drilling in each of the two work phases. Also in line with earlier years, surface drilling activity was more evenly distributed as junior companies accounted for 57% (1 550 300 m) of the total compared to 43% (1 174 300 m) for senior companies. Again, junior companies overtook senior companies in terms of surface drilling as these percentages were almost exactly the opposite in 2003. The total metres drilled from the surface by junior companies represented a remarkable 78% increase from the 2003 level of 872 700 m, marking another year of improvement for surface drilling by this type of company. Senior companies, on the other hand, saw their surface drilling activity increase by only 5% and their underground drilling activity increase by a more encouraging 33%.

Exploration-phase drilling by senior companies was mostly conducted from the surface while their deposit appraisal drilling mostly took place underground. As can be expected, the drilling activities of junior companies were almost exclusively focused on surface exploration and deposit appraisal.

1.4.3 Drilling by Type of Commodity Sought

In terms of total surface and underground drilling (including diamond drilling and other drilling methods) by group of commodity sought, **Figure 11** shows that exploration and deposit appraisal drilling activities in Canada in the period 2002-04 were primarily aimed at the discovery of precious metals and base metals. In 2004, a total of 2 242 570 m was drilled in the search for precious metals, representing 63% of total exploration and deposit appraisal drilling. Of this total, 1 654 730 m (74%) were drilled from the surface. Drilling for base metals accounted for 26% (912 490 m) of total exploration and deposit appraisal drilling and, once again, surface drilling was more prevalent with 75% (680 780 m) of the drilling aimed at this commodity group. Three

Figure 11
Surface and Underground Exploration and Deposit Appraisal Drilling (1) in Canada, by Commodity, 2002-04



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes diamond drilling and other drilling methods such as rotary and percussion.

observations about drilling should be noted in the context of base-metal ore reserve depletion, which continues to be a serious problem in Canada. The first one is that drilling for base metals clearly outgrew that for precious metals in 2004 with an increase of 64% in metres drilled compared to 29% for precious metals. Secondly, base metals' share of total drilling for all commodities increased by 4% in 2004. And, thirdly, within this commodity group, underground drilling increased its share of total drilling by 9%. It will be interesting to see in the 2005 data if these points are repeated as there may be an indication here that more serious attention might finally be focussed on the discovery of new base-metal reserves.

Surface drilling also accounted for most of the exploration and deposit appraisal drilling activity targeting commodities other than precious metals and base metals in 2004. In fact, it represented virtually all of the drilling conducted within these two phases of activity for the discovery of diamonds, uranium, nonmetals, coal and iron.

1.5 CLAIM STAKING

Claim staking is another useful indicator of exploration activity. It is particularly efficient at rapidly highlighting emerging trends, such as the mid- and late-1990s' exploration rush for diamonds, and at pinpointing areas of interest. Because claim staking usually happens at a relatively early stage of the exploration and deposit appraisal process, it also provides a good measure of current grass-roots-type activities and a good insight into where future advanced (deposit appraisal) work could be focused.

Claim-staking rules and guidelines differ across Canada. In recent years, mineral tenure has evolved with the advent of map staking and the granting of mineral rights to some Aboriginal groups who now administer their own regimes. Therefore, in order to ensure timeliness and accuracy of information on mineral tenure regulations in a particular Canadian jurisdiction, the reader is invited to contact the respective provincial/territorial mining recorder's office. Another useful source of information that summarizes the different mineral rights regimes found across Canada (i.e., ground vs. map staking; prospecting permits vs. claims; cost and size of claims, permits and leases; assessment work requirements; etc.) is the Provincial/Territorial Mining Rights Committee. This committee meets on an annual basis and maintains a number of summary tables on the administration of mineral tenure in Canada. One portal where these tables can be viewed is the the Ontario Ministry of Northern Development and Mines web site at www.mndm.gov.on.ca/mndm/mines/lands.

1.5.1 New Claims Staked

Just as for spending and drilling (the other two indicators of mineral exploration activity studied in this chapter), claim-staking activity was up considerably in 2004. The area of new mineral claims staked increased by 82% from 10.4 million hectares (Mha) to 19.0 Mha (**Table 9**). The largest area of new mineral claims recorded in a single year in Canada was 44 Mha in 1997, followed by 37 Mha in 1992 and 27 Mha in 1993. The total recorded for 2003 (10.4 Mha) was more the result of a consolidation of diamond exploration properties than a lack of interest by companies, as had been the case from 1998 to 2001. This consolidation followed 2002 staking rushes in Québec and Nunavut and also reflected further adjustments in Alberta and the Northwest Territories.

Every province and territory, except Nova Scotia and Ontario (with a minor drop), recorded a rise in their area of new mineral claims staked in 2004. While strengthening metal prices resulted in more staking activity across the country, the major increases are once again attibutable to diamonds. These large gains occurred in Nunavut (2.1 Mha), Alberta (1.8 Mha), the Northwest Territories (1.7 Mha), and Saskatchewan (1.4 Mha) where uranium in the Athabasca Basin was also a factor.

In terms of area occupied by claims in good standing at the end of 2004, Nunavut overtook Alberta with an area of 7.3 Mha (**Table 10**). Alberta still placed second with 6.4 Mha, an area significantly smaller than the 10.2 Mha it reported in 2003. This decrease was due to a large number of properties being dropped before the end of their 10-year permit term. Québec (5.7 Mha) and British Columbia (4.6 Mha) registered the third and fourth largest areas of claims in good standing in 2004.

1.5.2 Claims in Good Standing

Although there were provincial/territorial fluctuations, the total area occupied by claims in good standing amounted to approximately 4.1% of Canada's total landmass for the third year in a row in 2004. Losses in the area occupied by claims in good standing in Alberta (-3.7 Mha), Québec (- 0.8 Mha) and Nova Scotia (-0.1 Mha) were offset by gains in the nine other mining provinces/territories. Saskatchewan, the Northwest Territories and Manitoba led the way with increases of 1.3 Mha, 0.93 Mha and 0.91 Mha, respectively. As mentioned before, diamonds were a major reason for securing the rights to properties in all three of these jurisdictions, as were uranium in Saskatchewan and base metals, gold and platinum group metals in Manitoba.

In 2004, spending (off-mine-site) per hectare of claims in good standing ranged from $0.88/ha in Alberta to $76.40/ha in Nova Scotia (**Figure 12**). Variations in this ratio can sometimes be explained by the type of staking (ground vs. map) and the size of the claims or permits rather than by

TABLE 9. AREA OF NEW MINERAL CLAIMS (1) STAKED IN CANADA, 2003 AND 2004

Province/Territory	2003		2004	
	(hectares)	(%)	(hectares)	(%)
Newfoundland and Labrador	338 675	3.3	482 875	2.5
Nova Scotia	202 784	1.9	63 764	0.3
New Brunswick	46 976	0.5	102 816	0.5
Québec	1 204 523	11.6	1 546 640	8.2
Ontario	951 488	9.1	931 072	4.9
Manitoba	879 155	8.5	1 620 449	8.5
Saskatchewan	438 819	4.2	1 854 008	9.8
Alberta	2 904 300	27.9	4 727 344	24.9
British Columbia	912 575	8.8	1 169 050	6.2
Yukon	75 038	0.7	169 997	0.9
Northwest Territories	391 371	3.8	2 095 979	11.1
Nunavut	2 054 000	19.8	4 188 834	22.1
Total	10 399 704	100.0	18 952 828	100.0

Source: Provincial and territorial mining recorders.
(1) Excludes coal.

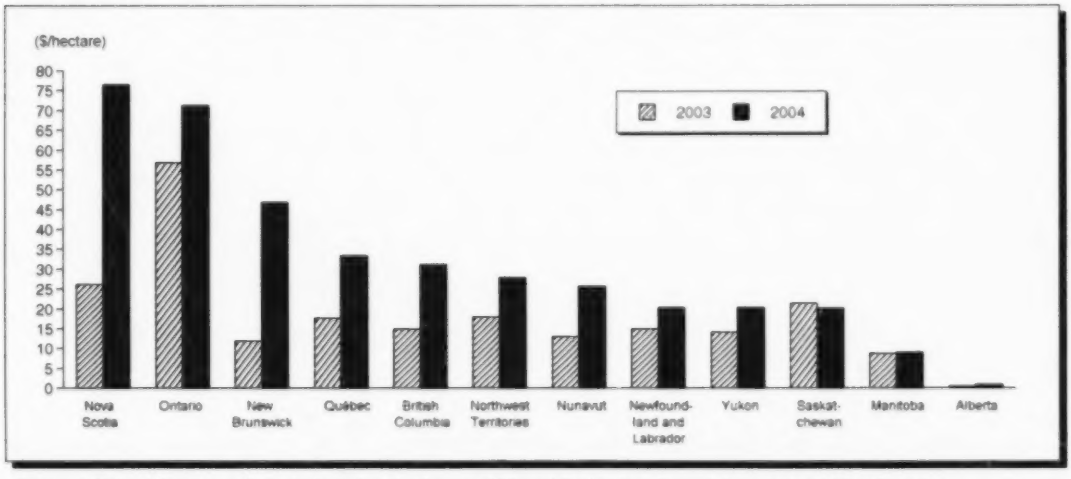
TABLE 10. AREA OCCUPIED BY CLAIMS IN GOOD STANDING IN CANADA, 2003 AND 2004

Province/Territory	Total Area	Area of Claims in Good Standing	Area of Claims/ Total Area
	(hectares)		(%)
2003			
Newfoundland and Labrador	40 572 000	1 502 769	3.7
Nova Scotia	5 549 000	218 470	3.9
New Brunswick	7 344 000	215 888	2.9
Québec	154 068 000	6 570 076	4.3
Ontario	106 858 000	2 927 120	2.7
Manitoba	64 995 000	2 578 114	4.0
Saskatchewan	65 233 000	2 170 000	3.3
Alberta	66 119 000	10 194 320	15.4
British Columbia	94 931 000	3 894 925	4.1
Yukon	48 345 000	900 236	1.9
Northwest Territories	143 232 000	3 003 000	2.1
Nunavut	199 400 000	7 145 000	3.6
Total Canada	996 646 000	41 319 918	4.1
2004			
Newfoundland and Labrador	40 572 000	1 596 550	3.9
Nova Scotia	5 549 000	116 164	2.1
New Brunswick	7 344 000	286 576	3.9
Québec	154 068 000	5 722 101	3.7
Ontario	106 858 000	3 183 600	3.0
Manitoba	64 995 000	3 492 970	5.4
Saskatchewan	65 233 000	3 498 000	5.4
Alberta	66 119 000	6 446 239	9.7
British Columbia	94 931 000	4 606 975	4.9
Yukon	48 345 000	1 087 975	2.3
Northwest Territories	143 232 000	3 931 426	2.7
Nunavut	199 400 000	7 323 318	3.7
Total Canada	996 646 000	41 291 894	4.1

Sources: Natural Resources Canada; provincial/territorial mining recorders.
Note: Data for Prince Edward Island are excluded.

Figure 12

Off-Mine-Site Exploration and Deposit Appraisal Expenditures Per Hectare of Claims in Good Standing in Canada, by Province and Territory, 2003 and 2004



Sources: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures; provincial/territorial mining recorder offices.
Notes: Off-mine-site exploration and deposit appraisal expenditures include costs incurred off-mine-site for field work and overhead, plus engineering, economic and feasibility studies, environment and land access costs. "Claims in good standing" excludes mining leases. Data for 2003 and 2004 are final.

the actual intensity of exploration (more advanced vs. reconnaissance-type work) in a given province/territory. However, Ontario once again demonstrates that it is the Canadian leader in exploration and deposit appraisal spending and that companies continue to seriously explore the ground positions they hold in this province with expenditures of $71/ha. For Canada as a whole, exploration and deposit appraisal spending (off-mine-site) amounted to an average of $25.22/ha, a significant 73% increase from the $14.55/ha recorded in 2003.

1.6 SHORT-TERM OUTLOOK FOR METAL PRICES

Metal prices continued to shine in 2005 as the recovery that began in 2002 continued to gain strength, helping both the production and exploration sides of the industry prosper. The news was not only good in the more closely watched gold and main base-metal commodity groups; other products such as uranium, silver, platinum, coal, molybdenum, tungsten and antimony also saw their prices improve considerably.

At the end of 2005, NRCan's Monthly Metals Price Index, which is based on the prices of gold, silver, copper, zinc, lead and nickel (**Figure 54** in Appendix 1), was continuing to progress, after dropping to a low in 2001, and had reached levels not seen since at least the late 1980s with monthly average prices for all six commodities reaching multi-year highs.

Nickel prices led the way over the recovery period, with the price as a whole for 2005 averaging US$6.69/lb, about 148% above the average price for 2001 before the recovery began. The price of nickel peaked in the first half of 2005, reaching US$7.68/lb in May before dropping to US$5.50/lb in November. At US$6.09/lb in December 2005, nickel was still showing strength.

Copper prices averaged US$1.67/lb in 2005, 133% higher than the average for 2001. In this case, the metal gained momentum in the second half of the year, ending it with a December 2005 average of US$2.08/lb.

Over the same 2001-05 period, the average price of lead increased by 105% from US21.6¢/lb to US44.2¢/lb, while zinc averaged US62.7¢/lb overall for 2005, up by 56% over the average price of 2001. It finished 2005 with an impressive average price of US82.6¢/lb.

The strong growth in Chinese power generation, construction, and production of consumer goods continues to be a substantial source of growth for base-metal demand. As well, supply constraints and low inventories are contributing to the upward pressure on prices and should keep base-metal prices strong relative to historic prices through 2006 and 2007.

As was the case for the other metals, the price of gold continued to rise and to drive exploration expenditures higher. From a US$270.99/oz average in 2001, the precious metal went through successive yearly average price increases to reach US$444.88/oz in 2005, a 64% gain over the 2001 level. Gold was still heading higher at the end of 2005 with a December 2005 average price of US$510.10/oz.

The gold market is very complex and many factors are cited by different analysts as contributing to the strength of the gold price. One factor is increased physical demand from increased jewellery and industrial production in the growing Asian economies, particularly China and India. Other factors include speculation by hedge funds and concerns about the long-term economic outlook for Europe and the United States, particularly the record U.S. trade and current account deficits. Political unrest and high oil prices are also seen as possible influences. These factors, together with limited selling by central banks, talk of some countries buying gold to boost reserves, and de-hedging by producers, should help keep upward pressure on the price of gold in the foreseeable future.

1.7 TAX INCENTIVES AND THE RECOVERY IN MINERAL EXPLORATION EXPENDITURE LEVELS

The downturn in exploration and deposit appraisal spending, which began slowly in 1997 and bottomed out in 2000, led to a considerable weakening of Canada's junior mining sector, a further reduction in the country's mineral reserves of gold and base metals, and an acceleration of anticipated mine closures. In response to demands for assistance from affected stakeholders (exploration and mining industry, communities, provinces/territories), the federal government introduced the Investment Tax Credit for Exploration (ITCE) in October 2000. This 15% non-refundable federal tax credit, available only to individual investors in flow-through shares of exploration and mining companies and initially proposed for a three-year period, was extended in the 2003 and 2004 federal budgets. Finally, it was phased out at the end of 2005, but issuing corporations will still be able to continue to incur eligible expenses until the end of 2006. A significant portion of the flow-through-share funds raised during 2005 will be available to finance activities in 2006.

In its yearly reports to Canada's Mines Ministers, the IGWG sub-working group on taxation (see earlier reference to three of these reports in Section 1.3.2.3), which had for its mandate the evaluation of the effectiveness of these temporary incentives prior to their termination dates, concluded that the ITCE had been successful in increasing exploration activity levels. In its 2005 report, the last one before the phasing out of the ITCE, the sub-working group concluded that "In the last several years, the strong performances in terms of off-mine-site exploration spending, junior mining company spending, and flow-through-share funding suggest that the ITCE, related provincial tax credits and Québec super deductions have helped revitalize the Canadian mineral exploration industry. Rising commodity prices and a favourable capital market were also critical factors in this recovery."

An issue that needs consideration is the fact that the exploration effort is currently concentrated on grass-roots and off-mine-site types of exploration. The need for increased deposit appraisal and on-mine-site work exists, particularly in mature mining camps where some mines are facing ore reserves challenges and where new investments could contribute more quickly to the economy of local communities. Initiatives are required to sustain the Canadian mining industry; these could include ways of supporting the more advanced work phases of the mineral development cycle.

1.8 SHORT-TERM OUTLOOK FOR EXPLORATION AND DEPOSIT APPRAISAL SPENDING IN CANADA

The three key indicators of exploration and deposit appraisal activity (drilling, claim staking and, in particular, spending) reveal that this essential component of the Canadian mining industry has recovered from one of its worst downturns and is now thriving. With a positive short-term outlook for metal prices and continued access to favourable capital markets, as well as the current industry momentum, exploration and deposit appraisal work should remain strong in 2006. However, it may not necessarily grow at or near the pace of the past few years, or even progress at all.

Among the issues likely to affect the performance of the Canadian mineral exploration industry in 2006 will be the uncertainty resulting from the phasing out of the ITCE and the effect that the cancellation of this program will have on the junior mining sector and off-mine-site spending. Also, while exploration and deposit appraisal expenditures by junior mining companies continued to soar in 2005, spending by senior companies, although significant, did not increase. An intensification of these companies' activities is needed to address concerns about the relative lack of advanced exploration and deposit appraisal work, declining levels of ore reserves, and the future of well-known Canadian mines and mining camps.

Overall, 2006 should be a good year for the Canadian mineral exploration sector. However, this could also be a year where surging exploration and deposit appraisal activity levels pause or even enter into negative growth territory.

2. Regional Outlook

2.1 INTRODUCTION

This section presents comments from provincial and territorial officials on recent exploration and deposit appraisal activities in their respective jurisdictions and indicates their expectations for 2005 and beyond. It also highlights important fiscal, regulatory and geoscientific initiatives.

The reader should note that some provinces/territories, in their respective review of activities, use the term "exploration" in its broad sense; that is, it includes both exploration (grass-roots) and deposit appraisal (advanced) components. The expenditure data mentioned by the different provincial and territorial authorities may also differ from those reported in Chapter 1 (official federal-provincial/territorial figures released by NRCan) because some of these jurisdictions use different criteria or definitions in their own analyses.

2.2 NEWFOUNDLAND AND LABRADOR[8]

2004 Overview and 2005/06 Forecasts

Expenditures on mineral exploration in Newfoundland and Labrador totaled $33.2 million in 2004, a 44% increase over the previous year (**Figure 13**). Increases occurred in all commodity groups (**Table 11**) but relate, in particular, to exploration for nickel at Voisey's Bay and for iron ore in western Labrador.

In 2004, base-metal exploration accounted for 47.8% of total expenditures, followed by precious metals at 35.5% and then by other commodities (e.g., iron ore, uranium, dimension stone and industrial minerals) at 16.7%. Almost 99% of precious-metals exploration took place in Newfoundland, whereas base-metals exploration was split 55% for Newfoundland and 45% for Labrador. The majority (80%) of exploration for other commodities occurred in Labrador.

Claim staking increased 42% over 2003 to 19 343, and claims in good standing at year-end held steady over the same time period (**Figure 14**). Diamond-drilling activity increased by 88% in 2004 to 110 158 metres (m) (**Figure 15**). This increase in diamond drilling is directly related to gold exploration on the Island.

In 2004, exploration and deposit appraisal spending highlights for Labrador consisted of approximately $5 million at Voisey's Bay by Voisey's Bay Nickel Company Limited, mostly on the satellite deposits around the Ovoid nickel-copper-cobalt deposit; $1.6 million by New Millenium Capital Corp. on iron ore exploration near Schefferville, western Labrador; and $1.4 million by Altius Resources Inc. in the Central mineral belt for uranium and iron oxide-copper-gold (IOCG) and at Michikamau Lake for nickel.

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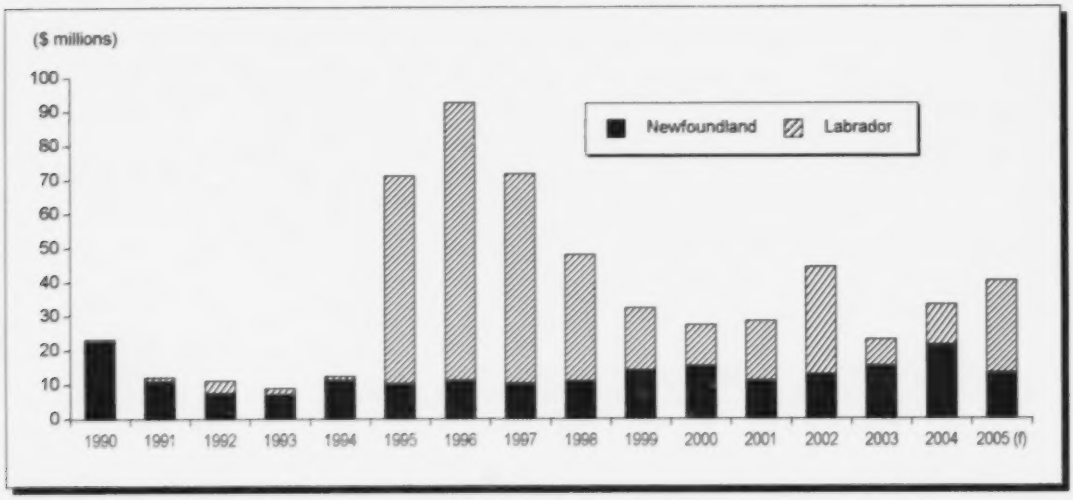
[8] The Newfoundland and Labrador review of activities was prepared by Ges Nunn. For more information, the reader is invited to contact Mr. Nunn by telephone at (709) 729-6418 or by e-mail at gesnunn@gov.nl.ca.

Figure 13
Newfoundland and Labrador Exploration Expenditures, 1990-2005



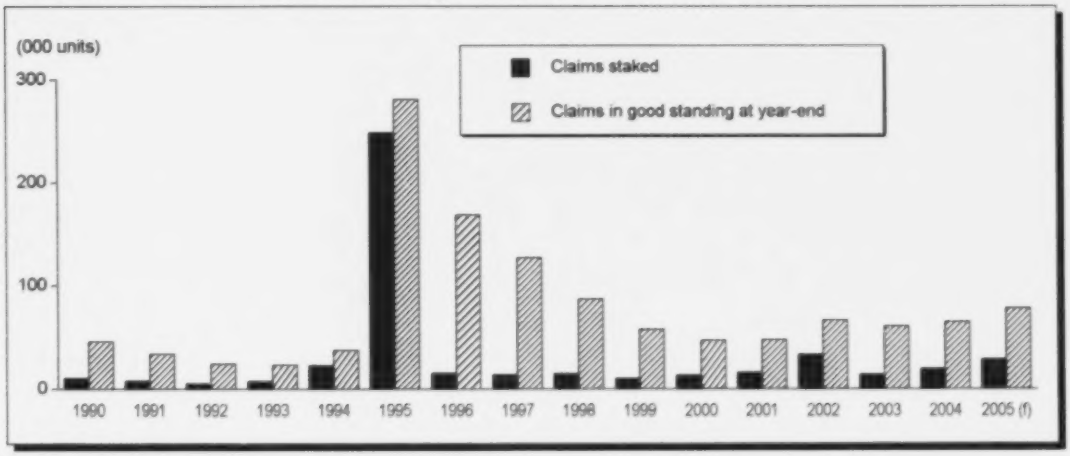
Source: Newfoundland and Labrador Department of Natural Resources.
(f) Forecast.
Note: Expenditures include administration and overhead costs.

TABLE 11. NEWFOUNDLAND AND LABRADOR EXPLORATION STATISTICS, 2000-2006

	2000	2001	2002	2003	2004	2005 (p)	2006 (f)
				(dollars)			
Exploration expenditures	27 316 669	28 441 725	44 189 877	23 073 735	33 201 593	40 345 000	45 000 000
Base metals	19 246 046	22 585 446	33 975 242	11 353 274	15 855 261	..	..
Precious metals (gold)	6 381 634	2 720 449	7 000 053	9 796 698	11 781 737	..	..
Other	1 179 312	3 135 830	3 214 582	1 923 763	5 564 595	..	..
				(number)			
Claim staking (year-end)							
Claims staked	12 969	15 665	33 126	13 547	19 343	28 000	15 000
Claims in good standing	46 880	47 425	66 287	60 654	64 464	78 000	80 000
				(metres)			
Diamond drilling	74 546	47 176	66 696	58 618	110 158	90 000	100 000
Exploration	67 626	39 455	52 633	52 030	103 967	..	..
Production/development	6 920	7 721	14 063	6 588	6 191	..	..

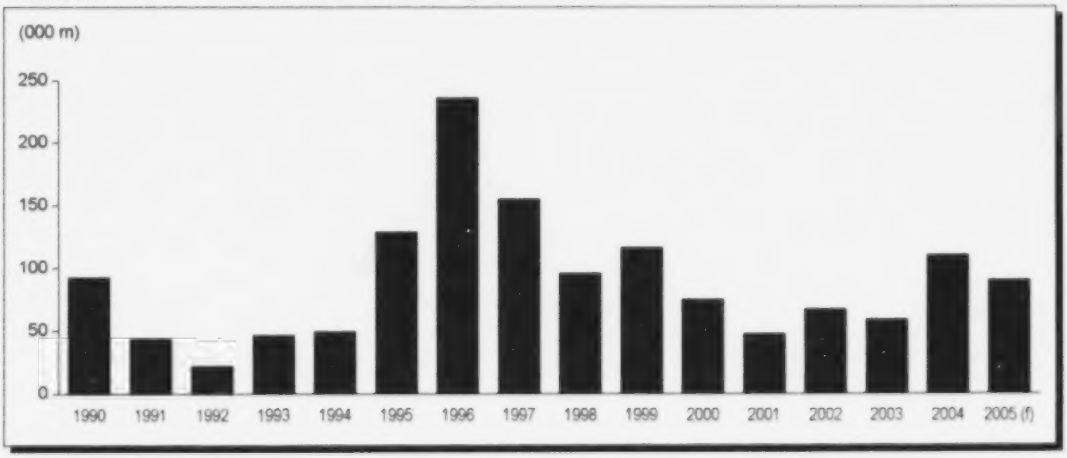
Source: Newfoundland and Labrador Department of Natural Resources.
.. Not available; (f) Forecast; (p) Preliminary.
Note: Data are current as of October 2005.

Figure 14
Newfoundland and Labrador Claim Staking, 1990-2005



Source: Newfoundland and Labrador Department of Natural Resources.
(f) Forecast.

Figure 15
Newfoundland and Labrador Diamond Drilling, 1990-2005



Source: Newfoundland and Labrador Department of Natural Resources.
(f) Forecast.

Spending highlights for the Island of Newfoundland in 2004 include: over $3 million by Rubicon Minerals Corporation for gold, mostly at Golden Promise, central Newfoundland, and near Glenwood in the Botwood Basin, northeast Newfoundland; $2.5 million by Cornerstone Resources Inc. throughout the island for both gold and base metals; $2.2 million by Aur Resources Inc. near the Duck Pond base-metal deposit; $1.78 million by VVC Exploration Corp. at the Beaver Brook antimony mine; $1.38 million by Crosshair Exploration & Mining Corp. for gold in central and northeast Newfoundland; $0.97 million by Richmont Mines Inc. at Valentine Lake; and $0.95 million by Altius Resources Inc., mostly for base metals at Rambler North, Roberts Arm and South Tally Pond.

For 2005, with the exception of diamond drilling, all preliminary exploration indicators show an increase (**Table 11**). Exploration expenditures are estimated to increase by approximately 12% to around $40 million and diamond drilling is forecast at approximately 90 000 m. The increase in exploration expenditures is attributed to continued exploration for gold on the Island and to renewed levels of exploration for uranium and nickel in Labrador.

The forecast for 2006 is for claim staking to return to historical levels, at around 15 000, and for exploration expenditures to increase to around $45 million.

New Mines

Inco Limited commenced mining at Voisey's Bay in northern Labrador in 2005. The Ovoid nickel-copper-cobalt deposit contains proven and probable reserves of 32 million tonnes (Mt) grading 2.82% nickel, 1.54% copper and 0.14% cobalt, and 50 Mt of indicated mineral resources grading 1.66% nickel, 0.78% copper and 0.09% cobalt.

Mining of the Ovoid is an open-pit operation. First concentrate is expected to be ready for shipment to Sudbury for processing in November 2005, approximately six months ahead of the original schedule.

In December 2004, Aur Resources Inc. announced that it would proceed with the development of the Duck Pond and Boundary base-metal deposits, 35 kilometres (km) east-southeast of Buchans in central Newfoundland. Geotechnical and engineering work and infrastructure development is estimated at $92 million spread over 2005/06. The mine is scheduled to start producing late in 2006.

The deposits contain reserves of approximately 4.1 Mt at an average grade of 5.68% zinc, 3.29% copper, 59.3 grams/tonne (g/t) silver and 0.86 g/t gold. About 3.7 Mt will be mined from underground at the Duck Pond deposit and 0.4 Mt will be extracted by open pit at the Boundary deposit. Production will consist of 76 million lb of zinc, 41 million lb of copper, 536 000 oz of silver and 4100 oz of gold annually from 2007 to 2014. Potential mining of an additional inferred resource of 1.1 Mt grading 7.05% zinc, 3.04% copper, 71.2 g/t silver and 0.81 g/t gold could add two years to the life of the mine.

In January 2005, Anaconda Gold Corp. received a positive feasibility study for the Pine Cove gold deposit, located on the Baie Verte Peninsula in north-central Newfoundland. Since then, a revised feasibility study and additional diamond drilling have been completed. Anaconda Gold Corp. plans to put the property into production in 2006.

An indicated resource of 2.216 Mt grading 2.94 g/t gold and an inferred resource of 0.837 Mt grading 2.2 g/t gold were reported for an approximate contained total of 268 700 oz of gold. The resource will be extracted by open-pit mining over an estimated six-year period.

In September 2005, Central Holdings Inc. completed the purchase of the assets of International Granite Corporation. Central Holdings Inc. will continue the quarrying of gabbro from the Mount Peyton complex in central Newfoundland, principally for the memorial stone market.

Development-Stage Projects

At the LabMag iron ore project near Schefferville in western Labrador, New Millenium Capital Corp. has completed Phase I of its program on the magnetite-iron ore deposits. Diamond drilling in Block A commenced in 2004 and was completed in the winter of 2005. In late May, an indicated mineral resource of 1045 Mt grading 69.4% iron in concentrate and an additional inferred mineral resource of 760.7 Mt was reported for Block A and was interpreted to be sufficient to support the production of 10 Mt of pellets per annum from mining of 33 Mt/y of crude ore for 20-30 years.

Phase II has commenced and will include additional drilling, bulk sampling and metallurgical testing, and evaluation of satellite properties. Economic, pre-feasibility and baseline environmental studies are ongoing.

In August 2005, VVC Exploration Corp. announced a restructuring of the ownership of the Beaver Brook antimony project in central Newfoundland. In 2004, VVC Exploration Corp. purchased the property, including significant mine infrastructure, from Beaverbrook Resources Ltd. for approximately $17 million and established a wholly owned subsidiary, Beaver Brook Antimony Mines Inc., to plan and operate the mine reactivation program.

The Beaver Brook antimony deposit contains an all-categories resource of 1.943 Mt grading 4.32% antimony at a 2% antimony cut-off. A feasibility study is in progress.

Atlantic Barite Ltd. collected a 500-t sample from the tailings ponds on its property at Buchans in central Newfoundland and sent it for trial testing in August. If successful, the refurbished 15 000- to 25 000-t/y processing plant in Buchans is expected to come into operation in 2006 and to have a potential mine life of 15-20 years. The barite is a flotation product from the tailings of the former Buchans mines.

2005 Exploration Highlights - Labrador

Exploration in Labrador in 2005 was directed mainly toward nickel and uranium exploration. Properties are shown in **Figure 16** unless noted otherwise.

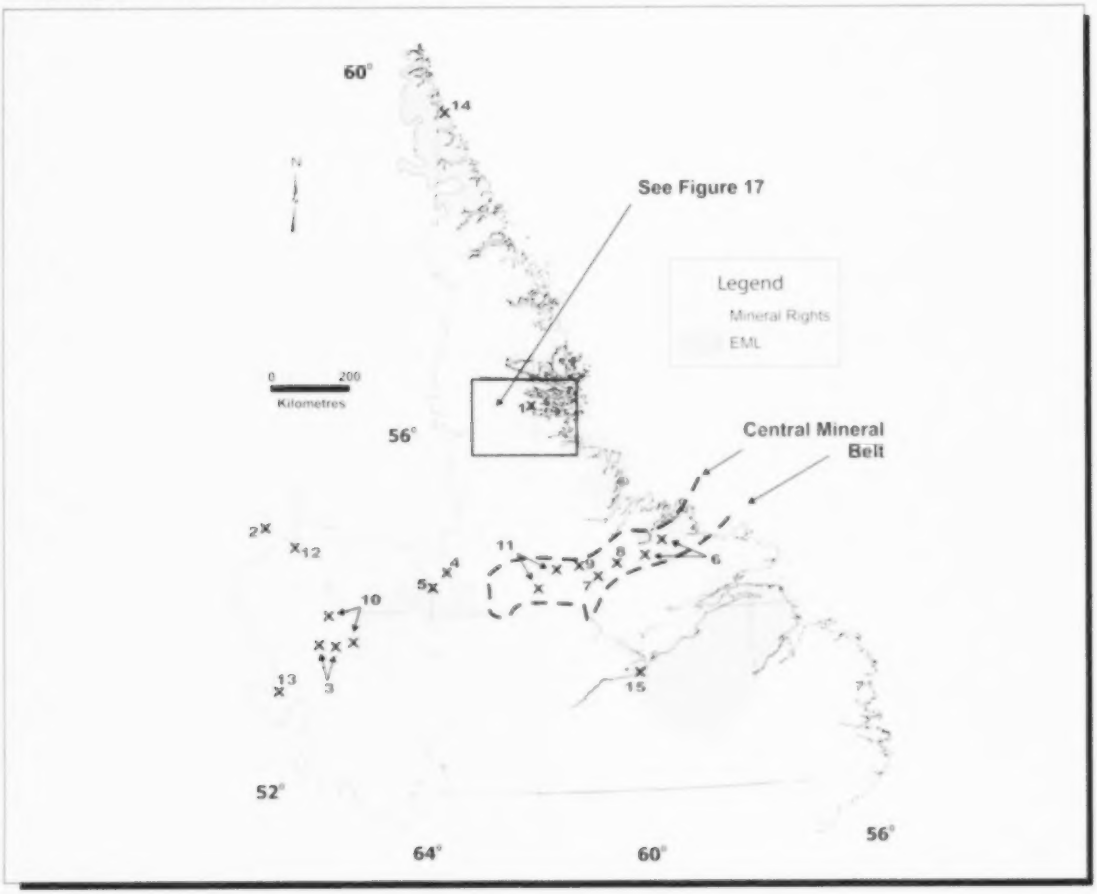
Nickel

At Voisey's Bay in northern Labrador (**Figure 17**), Voisey's Bay Nickel Company Limited conducted diamond drilling and surface and downhole geophysical surveys on the Reid Brook zone and the Eastern Deeps, the two largest satellite deposits to the west and east, respectively, of the Ovoid nickel-copper-cobalt mine. On August 24, Inco Limited staked 6884 claims having nickel potential in the area of the Garland Lake property, south of Voisey's Bay. The combined properties form a 9113-claim land position.

Other companies exploring for nickel in the Voisey's Bay area of northern Labrador (**Figure 17**) include: the Cornerstone Resources Inc.-Falconbridge Limited joint venture on the Konrad project (ground geophysical follow-up of airborne geophysical anomalies); the Celtic Minerals Limited-Jilbey Gold Exploration Ltd. partnership at West Voisey's Bay (compilation and ground geophysics); and Nortec Ventures Corp., on its earn-in option from Vulcan Minerals Inc., on the TL property (diamond drilling).

As well, in western Labrador, nickel exploration programs were completed by: the Gallery Resources Limited-BHP Billiton Diamonds Inc. partnership on its Shabogamo project in the western Smallwood Reservoir area (airborne geophysics, ground follow-up and diamond drilling); and by the Altius Resources Inc.-Teck Cominco Limited joint venture (mapping, ground geophysics and diamond drilling) near Michikamau Lake in the eastern Smallwood Reservoir and, in the same area, by Brilliant Mining Corp. (airborne geophysics).

Figure 16
Property Location Map, Labrador, 2005



NEW MINE

1. Voisey's Bay

DEVELOPMENT-STAGE PROJECT

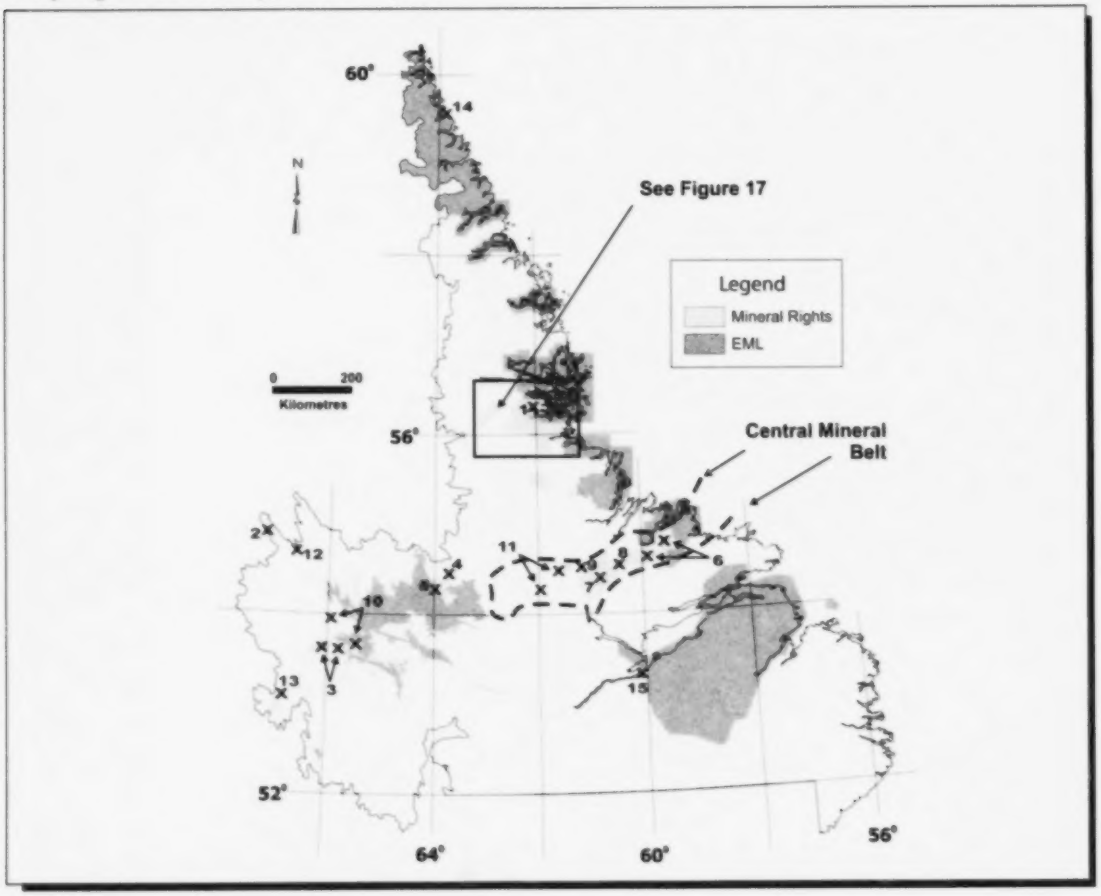
2. New Millenium Capital Corp.

EXPLORATION PROPERTIES

3. Gallery Resources Limited
4. Altius Resources Inc.
5. Brilland Mining Corp.
6. Aurora Energy Inc.
7. Crosshair Exploration & Mining Corp.
8. Santoy Resources Ltd. and Peter Haring
9. 10565 Nfld. Inc.
10. Consolidated Abaddon Resources Inc.
11. 10565 Nfld. Inc.
12. Anglessey Mining Corp. plc
13. Iron Ore Company of Canada
14. Freeport Resources Inc.
15. Markland Resources Development Inc.

Source: Newfoundland and Labrador Department of Natural Resources.
EML: Exempt mineral lands.

Figure 16
Property Location Map, Labrador, 2005



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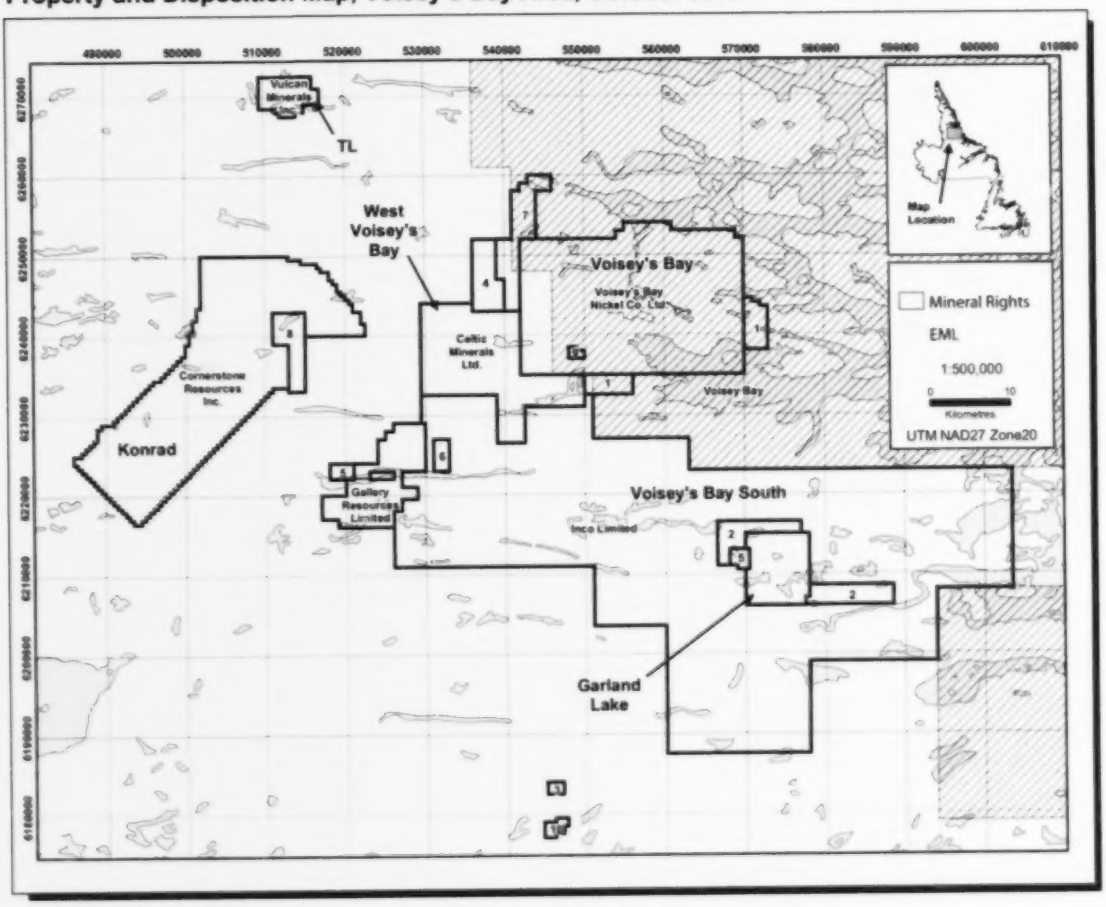
10. Consolidated Abaddon Resources Inc.
11. 10565 Nfld. Inc.
12. Anglessey Mining Corp. plc
13. Iron Ore Company of Canada
14. Freeport Resources Inc.
15. Markland Resources Development Inc.

Source: Newfoundland and Labrador Department of Natural Resources.
EML Exempt mineral lands.

Figure 17
Property and Disposition Map, Voisey's Bay Area, October 2005



PROPERTIES

1. CanAlaska Ventures Ltd.
2. Cornerstone Resources Inc.
3. Don Hawco
4. Evolving Gold Corp.
5. Freeport Resources Inc.
6. Gallery Resources Limited
7. Geocore Exploration Inc.
8. International CanAlaska Resources Ltd./ Pacific North West Capital Corporation
9. NDT Ventures Ltd.
10. Patrick J. Laracy

Source: Newfoundland and Labrador Department of Natural Resources.
EML Exempt mineral lands.
Note: Detailed mineral claim maps are available for viewing on-line at http://gis.geosurv.gov.nf.ca.

Uranium

The eastern half of the Central Mineral Belt is the focus of the majority of the exploration for uranium. During exploration in the 1970s, a number of uranium deposits and prospects were discovered in the eastern parts of the belt. Current exploration programs are re-evaluating these discoveries.

In June, the Altius Resources Inc.-Fronteer Development Group Inc. strategic alliance was restructured and a new company, Aurora Energy Inc. (48% Altius Resources, 52% Fronteer Development), was formed to manage and operate their Central Mineral Belt project. By funding all of a $5 million, July 2005-June 2006, exploration program, Fronteer Development Group Inc. will increase its interest to 57%. The alliance controls 3248 claims in three properties in the area.

The main 3192-claim property contains the Michelin uranium deposit. The deposit is estimated to contain a historic resource estimate, above a depth of 270 m, of 6.426 Mt grading 0.13% U_3O_8 and containing 18.3 million lb of uranium. Following compilation of 308 historic diamond drillholes and 642 m of underground workings, a diamond-drilling program was initiated to test for extensions to the mineralization in the Michelin deposit at depth.

At Otter Lake and Jacque's Lake, to the east and northeast of the Michelin deposit, respectively, large, previously undrilled, radiometric anomalies have been mapped and sampled in detail. Diamond drilling has commenced at the former and is planned for the latter.

To the west, Crosshair Exploration & Mining Corp. has completed a compilation of historic data on its 2445-claim Moran Lake property. The compilation included re-sampling and analysis of historic core from the Moran C zone and Moran B zone occurrences. The Moran C zone has a historic resource estimate of 0.027 Mt grading approximately 0.1% U_3O_8. Airborne, radiometric and magnetic geophysical surveys and follow-up sampling and analysis were completed in the fall, and ground geophysical surveys, including gravity, are planned for the Moran B and C zones.

Other projects in the Central Mineral Belt include the 3014-claim Santoy Resources Ltd. project. The company has assembled its property package through a combination of options and staking. Santoy Resources Ltd. completed airborne geophysics, and diamond drilling is planned.

As well, other Central Mineral Belt claim holders include 10565 Nfld. Inc. and Peter Haring, with 2375 claims, in the central regions of the belt.

In western Labrador, Consolidated Abaddon Resources Inc. completed airborne geophysical surveys and ground follow-up of anomalous areas on its Sims Lake and Gabbro Lake properties.

Other Commodities

10565 Nfld. Inc.'s Seal Lake copper project is located in the western half of the Central Mineral Belt. Locally, these claims have rare earth metals and related potential.

In western Labrador, near Schefferville, Anglesey Mining Corp. plc proposes to mine 3-5 Mt/y of direct-shipping-grade lump (67% iron) and sinter (63% iron) hematite ore. Anglesey Mining Corp. plc has one year in which to complete due diligence on the project before committing itself to the option.

Also in western Labrador, exploration for iron ore and dolomite is being conducted by Iron Ore Company of Canada. Elsewhere, Freeport Resources Inc. collected a bulk sample from its heavy minerals project at Iron Strand in northern Labrador, and Markland Resource Development Inc. sampled a series of sections through the glacio-fluvial sands along the Churchill River near Goose Bay, also for heavy minerals. Freeport Resources Inc.'s sampling indicates an average of over 60%

garnet and grades 4.12% TiO_2; a preliminary estimate is that it could support a 20 000-t/y operation for over 20 years. The garnet is a high-quality abrasive suitable for use in water-jet cutting.

2005 Exploration Highlights - Newfoundland

Exploration on the Island of Newfoundland during 2005 has focused on gold and base metals. Properties are shown in **Figure 18** unless noted otherwise.

Gold

At Valentine Lake (**Figure 19**) in central Newfoundland, Richmont Mines Inc. (under option from Mountain Lake Resources Inc.) completed three phases of diamond drilling designed to further upgrade the resource. Richmond Mines Inc.'s most recent upgrade, in May, reported 439 654 troy oz of contained gold from 1.3 Mt of inferred resources grading 10.5 g/t gold. Three-dimensional modelling is in progress.

Rubicon Minerals Corporation has delineated the Jaclyn Main zone on its Golden Promise property (**Figure 18**), in central Newfoundland, over a strike length of 375 m and to a depth of 192 m, and is preparing a preliminary resource estimate for the zone. Rubicon Minerals Corporation has discovered several other gold-bearing zones on the property.

Rubicon Minerals Corporation was also involved in gold exploration programs on the Avalon Peninsula; at the Glenwood Break, Joe Batts Linear (H-Pond) and Wings Point-Titan projects in northeastern Newfoundland; and, through an option to Crosshair Exploration & Mining Corp., on the Golden Promise South properties in central Newfoundland.

On the Baie Verte Peninsula in north-central Newfoundland, Cornerstone Resources Inc. and new joint-venture partner Agnico-Eagle Mines Ltd. completed diamond drilling and soil sampling on the El Strato property. Additional ground geophysical surveys and diamond drilling are planned.

Kermode Resources Ltd. has completed several phases of diamond drilling at its Jackson's Arm property, located on the Great Northern Peninsula near White Bay. An additional 4000 m of diamond drilling is planned.

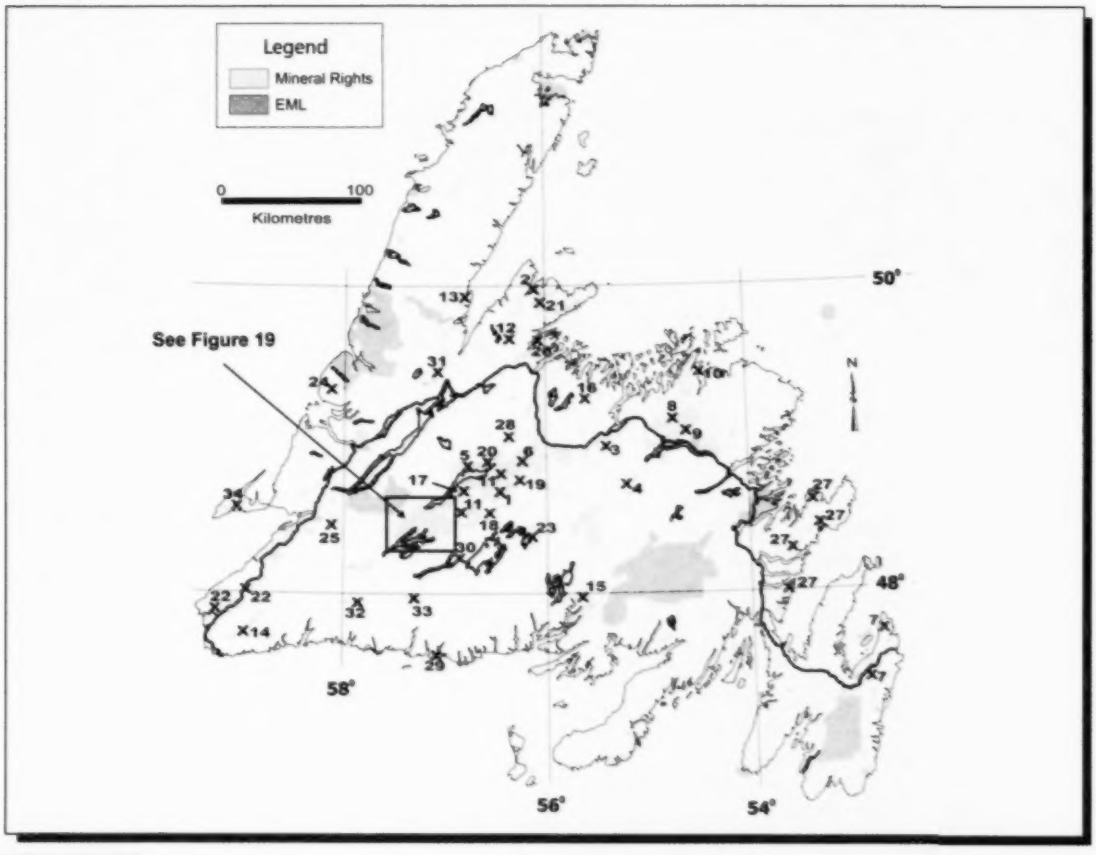
Diamond-drilling programs were also conducted, or are ongoing, by the Cornerstone Resources Inc.-Thundermin Resources Inc. joint venture and by the Terra Nova Gold Corp. option from South Coast Ventures Inc. on their respective Cape Ray properties in southwest Newfoundland; by Moydow Mines International Inc. on the True Grit property in southern Newfoundland; and by Altius Resources Inc. on the Moosehead property in central Newfoundland.

Base Metals

The Boomerang massive-sulphide deposit was discovered by Messina Minerals Inc. during a diamond-drilling program on its central Newfoundland, Tulks South property (**Figure 19**) in December 2004. Subsequent diamond drilling, in panels 50 m apart, has extended the zinc-lead-copper-silver deposit by over 300 m of strike length and, at least locally, for up to 450 m in height (the massive-sulphide horizon has a near vertical dip). Messina Minerals Inc. has also extended the A-Zone massive sulphide lens at the Tulks East zinc prospect, located farther to the northeast in the Tulks South property.

Diamond drilling is ongoing at both Boomerang and Tulks East and a ground geophysical survey (gravity) is planned for the latter.

Figure 18
Property Location Map, Island of Newfoundland, 2005



NEW MINES

1. Duck Pond
2. Pine Cove
3. Central Holdings Inc.

DEVELOPMENT-STAGE PROJECTS

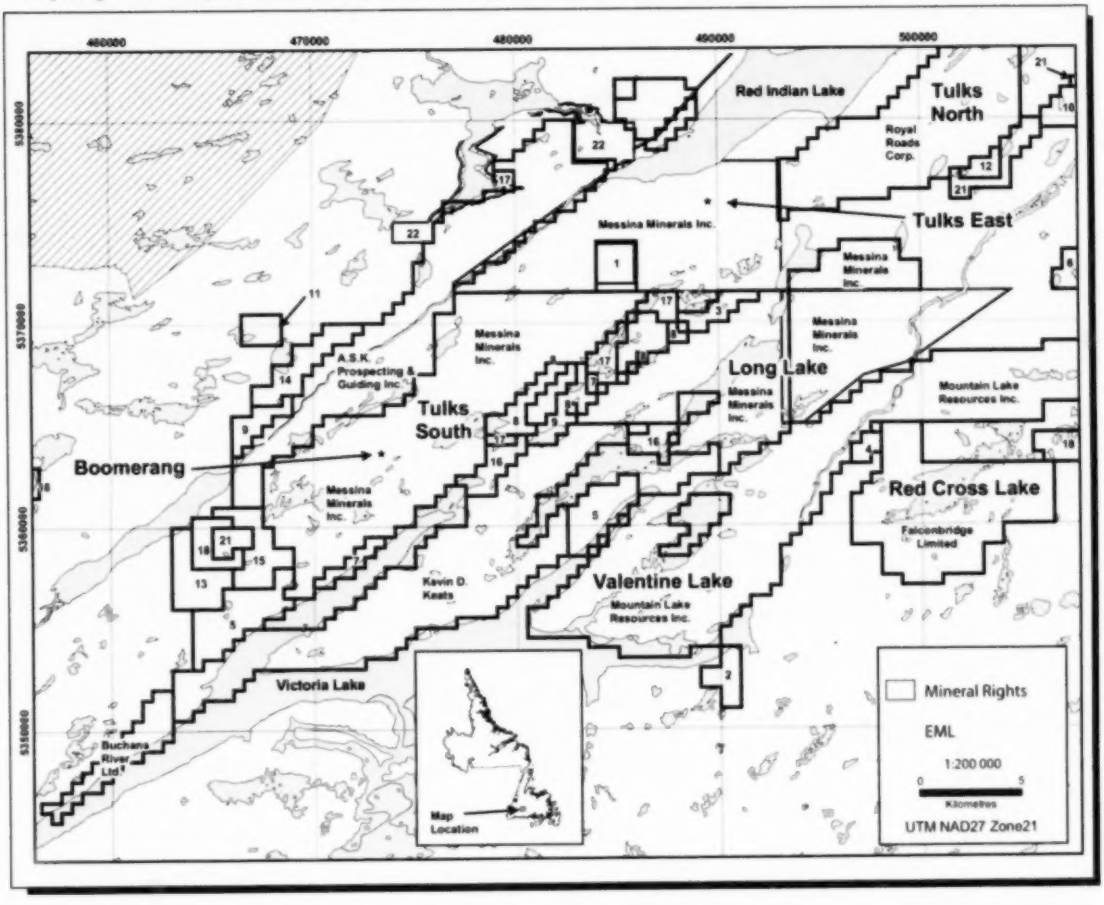
4. Beaver Brook
5. Atlantic Barite Ltd.

EXPLORATION PROPERTIES

3. Moosehead
6. Golden Promise
7. Avalon Peninsula
8. Glenwood Break
9. Joe Batts Linear
10. Wings Point - Titan
11. Golden Promise South
12. El Strato
13. Jackson's Arm
14. Cape Ray
15. True Grit
16. Point Leamington
17. Tulks North and Bobbys Pond
18. Noel Pauls Brook
19. Burnt Pond
20. Mary March and Buchans Junction
21. Rambler North
22. Codroy
23. Burnt Pond
24. Gregory River
25. Nita's Brook
26. Colchester
27. Bonavista Peninsula
28. LJG
29. Grey River
30. Granite Lake
31. Rocky Brook
32. Blue Hills
33. White Bear River
34. AggMapR Inc.

Source: Newfoundland and Labrador Department of Natural Resources.
EML Exempt mineral lands.

Figure 19
Property and Disposition Map, Tulks-Long Lake Area, October 2005



PROPERTIES

1. Buchans River Ltd.
2. Bruce Pellerin
3. Calvert Davis
4. Carl Chafe
5. Cornerstone Resources Inc.
6. Crosshair Exploration & Mining Corp.
7. Darrin Hicks
8. Don Hawco
9. Eddie Quinlan
10. Gary Rowsell
11. Lai Lai Chan
12. Marilyn Quinlan
13. Mark Crocker
14. Mervin Quinlan
15. North Range Resources Ltd.
16. Patrick J. Laracy
17. Paul Chafe
17. Roland Quinlan
18. Paul Crocker Sr.
19. South Coast Ventures Inc.
20. Steven Barrett
21. Quest Inc.
22. Star Lake Hydro Partnership

Source: Newfoundland and Labrador Department of Natural Resources.
EML Exempt mineral lands.
Note: Detailed mineral claim maps are available for viewing on-line at http://gis.geosurv.gov.nf.ca.

TLC Ventures Corp. is re-evaluating the resource at the Point Leamington zinc-copper-gold-silver deposit. The deposit contains 520 million lb of zinc and 348 000 oz of gold from an inferred resource of 12.3 Mt grading 1.92% zinc, 0.28% copper, 0.88% g/t gold and 16.94 g/t silver at a 1% zinc cut-off.

Other zinc exploration projects, all located in central Newfoundland, include: Royal Roads Corp. at Tulks North, Messina Minerals Inc. at Long Lake (**Figure 19**), Mountain Lake Resources Inc. at Bobby's Pond, Cornerstone Resources Inc. at Noel Pauls Brook, Volcanic Metals Exploration Inc. at Burnt Pond, Canstar Resources Inc. at Mary March, and Vinland Resources Limited at Buchans Junction.

Rambler Metals and Mining PLC continued a deep diamond-drilling program on its Rambler North copper-gold property on the Baie Verte Peninsula. The diamond drilling is testing the down-plunge extensions to mineralization in the Ming massive-sulphide deposit (a past-producing mine) and the Ming Footwall zone.

In June, Cornerstone Resources Inc. staked 970 claims in five properties in southwestern Newfoundland for copper. In August, Cornerstone Resources Inc. announced that Phelps Dodge Corporation of Canada, Limited would evaluate this Codroy project with a reconnaissance exploration program for a year before deciding whether to proceed with an option. Locally, these claims also have uranium, potash, coal, methane and oilshale potential.

Other exploration for copper included: Celtic Minerals Ltd. at Burnt Pond in central Newfoundland, Playfair Mining Ltd. at Gregory River and Benton Resources Corp. at Nita's Brook in western Newfoundland, and Cornerstone Resources Inc. at Colchester on Newfoundland's north coast and in the Bonavista Peninsula area of eastern Newfoundland.

Nickel exploration was conducted in central Newfoundland at Red Cross Lake (**Figure 19**) by Falconbridge Limited and by Benton Resources Corp. at the LJG property.

Playfair Mining Ltd. is upgrading the 1970 ASARCO tungsten resource (0.520 Mt grading 0.97% WO_3) for its Grey River property on the south coast of Newfoundland. Bulk sampling was completed and metallurgical testing is pending. Playfair Mining Ltd. also has initiated tungsten exploration at Granite Lake in central Newfoundland.

The Altius Resources Inc.-JNR Resources Ltd. joint venture completed reconnaissance diamond drilling around two areas of high-grade, uranium-bearing boulders on its Rocky Brook uranium property in western Newfoundland. The boulders have returned up to 11.5% U_3O_8 and 2.94% silver from grab samples. The ongoing diamond-drilling program will next focus on areas immediately up-ice (to the north) from the boulders.

Uranium exploration was also conducted by Commander Resources Ltd. on its Blue Hills and White Bear River properties in southern Newfoundland.

AggMapR Inc. is exploring for limestone and dolomite on the Port au Port Peninsula in western Newfoundland. These claims are in the vicinity of Atlantic Minerals Limited's Lower Cove limestone-dolomite mine.

Government

Initiatives

The Mineral Incentive Program (Junior Exploration Assistance and Prospectors Assistance) is in the second year of a three-year plan. Combined assistance for 2005 is expected to be approximately $1.65 million, most of which is "matched" by the recipients.

The Province introduced its new Mineral Rights Administration System (MIRIAD) on February 28, 2005. To date, over 19 000 claims have been staked from locations throughout the province, as well as from other locations across Canada, including British Columbia, Ontario, New Brunswick and Nunavut.

Clients using the system have made suggestions for improvements to the on-line staking part of MIRIAD. These include: a) the option to increase the size of the staking screen; b) the option to input UTM coordinates and zoom directly to an area; c) the option to turn on the names of claim holders; and d) upon completion of a staking transaction, the option to return to either 1) the last staked area, 2) the last map sheet, or 3) to a new UTM coordinate location. It is anticipated that some of these suggestions will be implemented by the end of 2005.

The Mineral Lands Division is in discussions with other branches and departments of government (e.g., Wildlife, Forestry, Environment, Municipalities) with a view to streamlining the permitting process for mineral exploration.

In addition, discussions are ongoing with Forestry in an attempt to mitigate the effects of mineral exploration on forest resources.

Aboriginal Issues

In 2005, the Labrador Inuit Land Claim, a tripartite agreement between the Inuit First Nation, the Government of Canada, and the Government of Newfoundland and Labrador, was fully ratified by the three bodies at a ceremony in Nain, Labrador. It is anticipated that the signed agreement will come into effect in December 2005. Negotiations establishing the Torngat National Park Reserve took place concurrently with the land claim negotiations and were an integral part of the process.

The agreement clearly outlines the authority of the Inuit of Labrador within the Labrador Inuit Settlement Area. Within 12 months of the effective date, the Inuit and the Province will have developed guidelines for mineral exploration and quarry permitting. Meanwhile, exempt mineral lands that do not fall within the Labrador Inuit Lands will come open for staking around mid-2006.

Negotiations with the Labrador Innu Nation on its land claim settlement are ongoing.

2.3 NOVA SCOTIA[9]

Nova Scotia 2005: More Gold and the Return of Coal

Overview

Mirroring the rosy global exploration picture, exploration activities in Nova Scotia in 2005 continued the significant increasing trend that started in 2003. Gold always seems to be a key component of the Nova Scotia exploration scene, and 2005 was no different. However, there was renewed interest in onshore and offshore coal resources, which was no doubt related to rising oil prices and the demand for raw materials from developing nations with strong economies. There has also been significant exploration for a variety of industrial mineral commodities and minor activity for base metals.

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[9] This review was prepared by George A. O'Reilly, Mineral Resources Branch, Nova Scotia Department of Natural Resources. For more information, the reader is invited to contact Mr. O'Reilly by telephone at (902) 424-2517 or by e-mail at gaoreill@gov.ns.ca.

Gold exploration and development is mostly focussed within the Cambro-Ordovician Meguma Group of the southern and eastern mainland. Projects are ongoing at several high-grade, lode-gold vein deposits for which the Meguma is well known, and also for low-grade, bulk-mineable, disseminated gold deposits of which one project is at the development stage. The coal basins of the northern mainland and Cape Breton Island are again targets for exploration for coal deposits and their potential for coal bed methane production is also of interest. The gypsum mining industry has been, and remains, strong in Nova Scotia with five producers operating at full capacity and one embarking on a major expansion program.

Exploration expenditures in Nova Scotia are forecast to be $8 million for 2005 (**Table 12**), a promising increase of $1.5 million from 2004, which itself enjoyed a significant increase from 2003 expenditures. The total area under licence (new and re-issued) grew to 17 000 claims, up from the 11 666 claims held in 2004. Diamond-drilling activity remained strong at 20 000 m, a slight drop from the 26 030 m drilled in 2004, but up significantly from the doldrums between 2000 and 2002 when just a few thousand metres were drilled each year (**Table 12**).

Mining Expansions and Announcements

During 2005, several existing mines in the province initiated planned expansions to their operations. Pioneer Coal Limited initiated infrastructure preparations prior to mining the eastern extension of the coal seam package, which it has been mining for several years in its Stellarton open-pit operation. Production is continuing from its existing open pit but is winding down; reclamation and backfilling of portions of the pit have already begun.

In September 2005, Fundy Gypsum Co., a division of U.S. Gypsum Canadian Mining Ltd., announced it will spend $10 million over the following 18 months to expand its open-pit mining operations outside the town of Windsor in central Nova Scotia. It is felt this move will ensure the future of the mine and its 150-160 jobs for at least 20 years. Immediate work consists of detailed diamond drilling and an environmental impact evaluation of a large deposit of gypsum adjacent to its existing Miller Creek pit. It is anticipated the exploration and the environmental review process will take 18 months and that production will begin in 2007.

When Cape Breton Development Corporation (DEVCO) ceased coal mining operations in Cape Breton in 2001, it was believed the days of coal mining as a major component of Nova Scotia's mining industry were over. When DEVCO ceased operations, the price of a tonne of coal was US$36; it is now approaching US$70. Once again there is serious interest in Nova Scotia's onshore and offshore coal resources. Leading the way is the 100-km^2 Donkin Coal Resource Block located offshore the community of Donkin at the eastern end of the Sydney Coal Field. The Donkin deposit, delineated in the early 1980s by DEVCO, has an estimated coal resource of 1.9 billion tonnes (Bt) from five seams. Late in 2004, the Province announced it would receive proposals for the development of the Donkin deposit until March 2005. Three groups submitted proposals that were evaluated by an Evaluation Committee who made recommendations to an Executive Council in June. A

TABLE 12. NOVA SCOTIA MINERAL EXPLORATION STATISTICS, 1998-2005

	1998	1999	2000	2001	2002	2003	2004 (p)	2005 (f)
Exploration expenditures (field + overhead) ($)	4 835 112	3 800 000	3 500 000	2 900 000	2 000 000	3 200 000	6 500 000	8 000 000
Claim staking (new and reissued) (general + special licences) (no. of claims)	11 452	14 045	10 951	8 406	12 494	19 125	11 666	17 000
Exploration drilling (metres)	20 297	16 860	8 200	5 470	3 540	12 200	26 030	20 000

Source: Nova Scotia Department of Natural Resources.
(f) Forecast; (p) Preliminary.

decision was then made to have each proponent make a presentation to the Evaluation Committee on certain aspects of their proposals. These presentations were completed in October and the committee will make its recommendation and the successful proponent will be selected before the end of 2005.

Black Bull Resources Inc. received a mining permit to produce quartz from its Yarmouth County White Rock property late in 2003. During 2004, initial mine infrastructure was constructed and production began in June by way of portable crushing and sorting equipment. During 2005, the company went through a significant managerial restructuring, including the appointment of Margaret Rhea as Vice-President, Marketing, to finalize market agreements and continue to seek out new ones. The company's intention is that continued sample testing of its fine sand product will result in further contracts for sales during the last quarter of the year. In addition, a 10-hole diamond-drill program was carried out 2 km southwest of the current mine site to further delineate the quartz-kaolin zone along strike from the current mine lease area.

MacLeod Resources Limited is continuing production of high-quality red marble from its quarry in southwestern Cape Breton Island. In addition to local markets established over the last few years, blocks are being cut and shipped to Italy for polishing where an Italian broker has been retained to market the product in that region. Important headway is being made in creating markets and, most importantly, in establishing a fine reputation for the product.

Mineral Exploration and Development Activity

Gold

Gold is never far off the radar screen in Nova Scotia and, once again, exploration for the metal is leading the way. Atlantic Gold NL, formerly known as Diamond Ventures, continued its feasibility study of the slate-hosted, disseminated gold mineralization at the Touquoy gold deposit at Moose River Mines, near Upper Musquodoboit. Atlantic Gold entered into a joint venture on the deposit with Moose River Resources Inc. in 2003. During 2005, 70 NQ drillholes totaling 5477 m were drilled on the deposit and assays have been returned for 26 of the holes to date. The results continue to show great promise for this deposit with intersections up to 49 m grading 2.9 g/t gold. At present, Atlantic reports the deposit contains 6.91 Mt grading 2.1 g/t gold for 472 000 oz of gold, of which 4.44 Mt (grading 2.1 g/t gold for 300 000 oz) are indicated resources and 2.47 Mt (grading 2.2 g/t gold for 172 000 oz) are inferred resources.

Atlantic Gold has also been very active in regional gold exploration on the eastern shore where it holds, either wholly or through joint-venture partnerships, 6668 claims (1079 km^2) between Lake Charlotte, Halifax County, and Goldenville, Guysborough County. Early in the spring, it embarked on a reconnaissance Rotary Air Blast (RAB) drill program in search of Touquoy-style disseminated gold mineralization along strike of several of the gold districts and some other areas of known anomalous gold geochemistry. To date, 550 holes have been drilled and promising results were obtained for two areas. A zone of anomalous gold and arsenic (36 parts per billion [ppb] of gold and 920 parts per million [ppm] of arsenic) has been defined for 7 km along strike to the northeast of the past-producing Caribou gold district (the Caribou trend). A second anomalous area has been defined southeast of Moose River in an area underlain by the same anticlinal structure that hosts the Gold Lake, Killag and Goldenville gold districts. Atlantic Gold is very encouraged with the results of its RAB drilling and feels it is an effective means to explore for Touquoy-style gold mineralization.

In September 2005, Atlantic Gold entered into a 50-50 exploration joint venture with Acadian Gold Corporation to continue exploration along the Caribou trend of anomalies outlined by earlier exploration. The agreement amalgamates Acadian Gold's tenements immediately adjoining the historic Caribou gold district with those of Atlantic Gold along the Caribou trend. Atlantic is manager of the joint venture.

In addition to the joint venture with Atlantic Gold, Acadian Gold Corporation has been very active in several other gold properties in the province. It currently holds, by joint venture or sole ownership, several significant gold properties, including some of the province's most significant past-producing gold districts. These include Goldenville, Forest Hill, Tangier, Upper Seal Harbour, Beaver Dam and Killag. Collectively, its properties have a measured and indicated resource of 376 251 oz of gold and an inferred resource of 933 797 oz. Exploration carried out by Acadian Gold on these properties in 2003 and 2004 continued in 2005, particularly at the Forest Hill, Goldenville, Tangier and Beaver Dam properties. Scoping studies and environmental permitting work are currently under way to allow Acadian Gold to re-enter the mines in order to carry out underground drilling, sampling and pre-feasibility studies in 2006.

Orex Exploration Inc. carried out 2500 m of surface, large-diameter core drilling on its Goldboro gold property. The holes twin previously drilled diamond drillholes found to contain intersections of visible coarse-grained free gold but returned low gold assays, believed due to a pronounced "nugget" effect. A revised sampling and assaying protocol has been derived and is being applied in order to provide more realistic and accurate gold grade determinations.

Iron Oxide-Copper-Gold (IOCG) Deposits

Exploration for iron oxide-copper-gold (IOCG) deposits along the Cobequid-Chedabucto fault zone continued in northern Nova Scotia. Avalon Ventures Limited, Canstar Resources Inc. (formerly Candor Resources) and a Wallbridge Mining Company Limited joint venture were all active. Avalon Ventures continued geochemical and geophysical surveys on the Mount Thom copper-cobalt-gold property. Drill targets defined to the west of the original "Esso" showing are currently being diamond-drilled. Canstar Resources carried out follow-up ground geophysical and geochemical surveys on targets delineated in 2003 by a reconnaissance induced polarization survey on its Black River property south of Kemptown, Colchester County. The target is a pronounced geophysical anomaly coincident with a highly altered fault zone recognized by geological mapping. The intention is for the 2005 follow-up surveys to bring the property to the drilling stage late in the year. A Bruce Hudgins-Wallbridge Mining joint venture on a claim block southeast of the IOCG-type Copper Lake copper-cobalt-gold deposit in Guysborough County advanced to a three-hole diamond-drill project. Earlier exploration consisted of prospecting, geochemical and induced potential surveys and trenching, and unearthed outcrop and boulder occurrences of ankerite veins in altered Horton Group siltstones. Knots and lenses of massive pyrite-chalcopyrite are present in the veins and contain up to 10% copper and 50 ppb gold.

Base Metals and Rare Metals

In the fall of 2005, Merrex Resources Inc. initiated a three-hole diamond-drilling program on Jubilee Minerals' carbonate-hosted Jubilee lead-zinc property at Little Narrows, Cape Breton. The drilling is intended to test for additional mineralized zones adjacent to those previously discovered at the property. A site at Egypt Road, Yarmouth County, which is adjacent to the metasediment-hosted Dominique tin-zinc-copper-indium prospect near the village of Wedgeport, is being examined by claim holder John Wightman for base-metal, indium, silver and rare metals potential. The focus of the program is to follow up on geochemical indications of similar style metasediment-hosted mineralization in an area north and east of the mineralized zones originally discovered and explored by Shell Canada Resources at Dominique between 1977 and 1979.

Coal Bed Methane

There currently is strong interest in the potential for coal bed methane in the thick coal seams of the Stellarton and Cumberland basins of northern Nova Scotia. In the Stellarton sub-basin alone, it is estimated that approximately 500 billion cubic feet of the resource exists down to a depth of 1200 m. Stealth Ventures Limited, a junior oil and gas company from Calgary, has acquired 24 000 acres in two blocks, one in Stellarton and one in the Springhill area. Stealth is actively exploring the blocks to define targets that it intends to drill before the end of the year.

Industrial Minerals

Several industrial mineral properties received attention during the year. Considerable interest is being expressed by companies in the Precambrian-age limestone deposits in the Creignish Hills of southwestern Cape Breton Island. Indications are that there may be thick units of calcium-rich limestone suitable for lime and cement markets. Site visits for industry representatives arranged by the Department of Natural Resources and Department of Economic Development resulted in samples being taken and tested. Results were promising and an evaluation of potential markets has been undertaken.

Federal Gypsum Company drilled five holes at Antigonish Harbour in search of gypsum to supply its wallboard plant that is currently under construction at Point Tupper near Port Hawkesbury on the Canso Strait. It also negotiated a contract with Nova Construction Company Ltd. to purchase gypsum from its Brierly Brook quarry near Antigonish.

2.4 NEW BRUNSWICK[10]

Exploration Highlights

Exploration expenditures in New Brunswick for 2005 are expected to reach $10.5 million in the search for metallic minerals and $3.5 million for potash, for a total of $14.0 million (**Figure 20**). This represents a significant increase over the $8 million expended on exploration in 2004. A total of 2809 mineral claims were recorded in New Brunswick between January 1 and November 30, 2005 (**Figure 21**). The number of mineral claims in good standing rose by about 1000 from 2004 to 18 700 in 2005 (**Figure 22**).

Gold

Exploration for gold in New Brunswick is continuing at a strong pace since significant discoveries were made at Poplar Mountain in 1994 and at Clarence Stream in 1999 by following up favourable geology and geochemical anomalies on provincial and federal maps. Subsequently, numerous other discoveries were made throughout the province, including the 2005 find of a high-grade, gold-bearing boulder (1320 g/t gold) by a government geologist, which sparked considerable interest and resulted in the staking of nearly 200 claims in the Harry Brook area to the north of Sussex.

In 2005, Freewest Resources Canada Inc. conducted 3000 m of diamond drilling on its Clarence Stream gold-antimony property in southeastern New Brunswick. To date, drilling programs have focused on further defining the resource base that can be extracted by open-pit mining methods. One new gold zone, referred to as the A zone, was delineated over a 250-m strike length and to a maximum vertical depth of 60 m during this drilling operation. Gold intersections in the A zone included 32.24 g/t over 5.0 m in Hole CS05-135 and 6.85 g/t over 7.5 m in Hole CS05-142. Further drilling tested the N zone over a 75-m strike length and to a vertical depth of 125 m. Assay results from the N zone included 8.35 g/t over 8.7 m in Hole CS05-165 and 4.28 g/t over 21.5 m in Hole CS05-183.

First Narrows Resources Corp. drilled eight holes totaling 1327.5 m in 2005 to test new soil geochemical gold targets on its Middle River gold property near Bathurst in northern New Brunswick. Assay results included 7.44 g/t gold over 6.5 m in Hole MR-05-006 and 3.35 g/t over 8.5 m in Hole MR-05-007.

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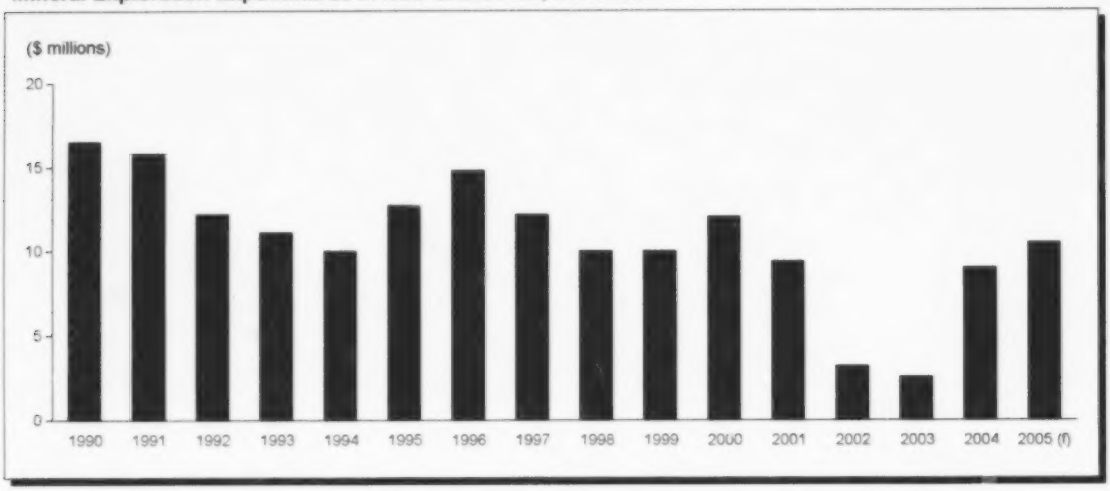
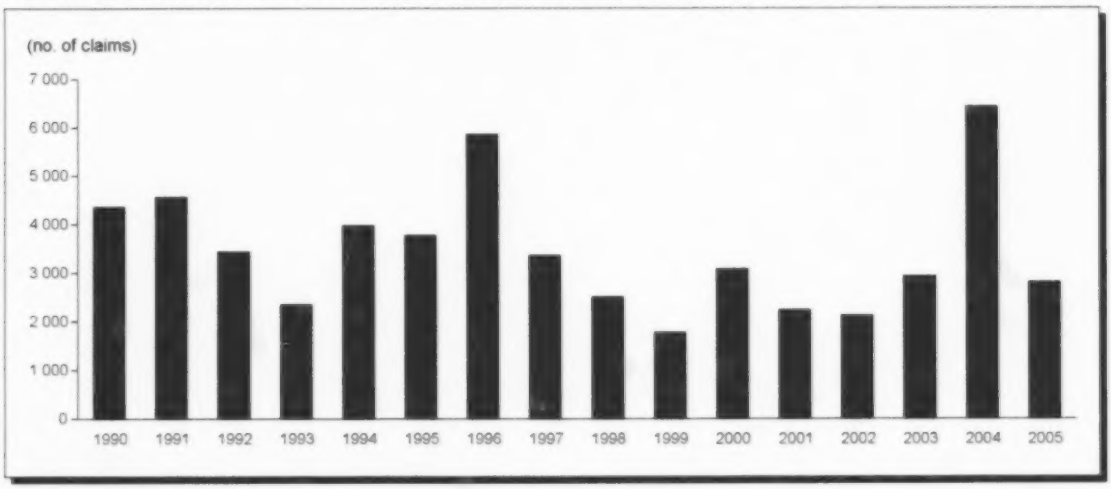
[10] The New Brunswick review of activities was compiled by Don J.J. Carroll and Leslie R. Fyffe. For more information, the reader is invited to contact Mr. Carroll by telephone at (506) 453-2206 or by e-mail at Don.Carroll@gnb.ca.

Figure 20
Mineral Exploration Expenditures in New Brunswick, 1990-2005



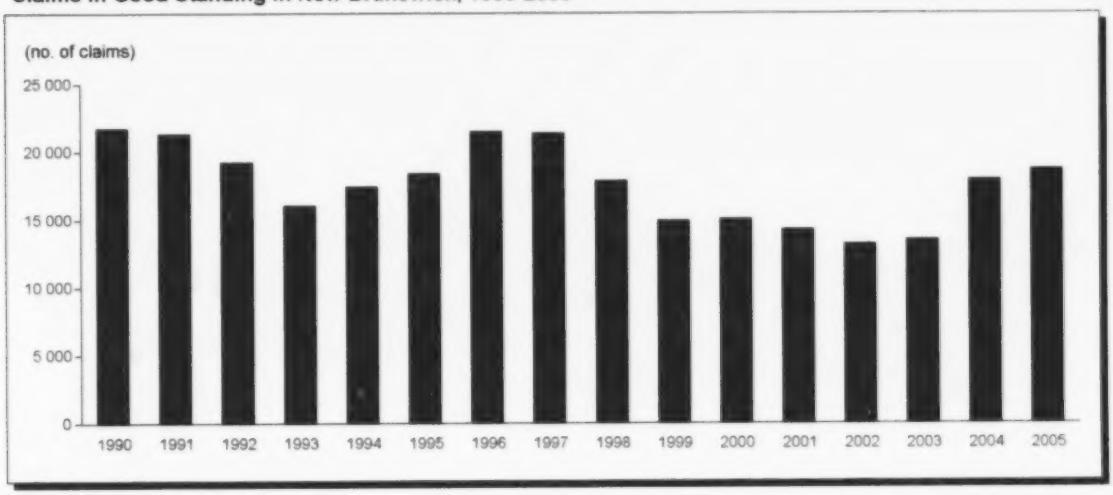
Source: New Brunswick Department of Natural Resources.
(f) Forecast of intentions.
Notes: General plus mine-site expenditures (includes overhead costs). Potash exploration expenditures are excluded.

Figure 21
New Mineral Claims Recorded in New Brunswick, 1990-2005



Source: New Brunswick Department of Natural Resources.

Figure 22
Claims in Good Standing in New Brunswick, 1990-2005



Source: New Brunswick Department of Natural Resources.

Stratabound Minerals Corp. drilled seven holes on its Elmtree gold property near Bathurst in 2005 to test the extension of the West Gabbro zone. Assay results included 2.05 g/t gold over 28.9 m in Hole 05-03 and 2.12 g/t over 34.7 m in Hole 05-06.

Mantle Minerals Inc. has optioned the Armstrong Brook gold property, located near Saint John, from Geodex Minerals Ltd. to test several drill-ready targets. The Armstrong Brook property covers the Cape Spencer open-pit gold mine which, from 1985 to 1988, produced 226 000 t of ore with an average grade of 1.6 g/t gold.

Polymetallic Minerals

Tin, tungsten, molybdenum, indium and antimony mineralization has long been known to be associated with high-level granitic plutons at Mount Pleasant, Lake George and Burnthill in New Brunswick. Increasing prices for these commodities have renewed interest in exploration for this type of deposit throughout the Atlantic Provinces.

Geodex Minerals Ltd. has begun an exploration program on the Sisson Brook copper-tungsten-molybdenum property in central New Brunswick. Zone III at Sisson Brook has an inferred resource of 10.82 Mt grading 0.151% WO_3 and 0.073% MoS_2 based on core assays from 13 holes drilled by Kidd Creek Mines Ltd. in 1981 and 1982. Soil and induced polarity (IP) surveys were conducted this summer and extensive drilling is currently under way to further test resources on the property.

In addition, Geodex Minerals is exploring the Kedron and Beech Hill polymetallic prospects in the Mount Pleasant area of southwestern New Brunswick. Re-assays of core drilled by Billiton Canada Ltd. on the Kedron property in 1984 yielded 0.34% tin, 2.00% zinc, 2.81% lead, 0.61% copper and 25.7 g/t indium over a 2-m interval. A sample of angular float from the Beech Hill property assayed 18.0% zinc, 312 g/t indium, 1600 g/t bismuth and 1.0 g/t gold.

Adex Minerals Corp. has contracted a geologist and an independent consulting company to re-assess the mineral resources of the Mount Pleasant deposit. Mount Pleasant is a former tungsten producer and is the largest known polymetallic deposit in the province.

Base Metals

Base-metal mining and exploration has been the mainstay of northern New Brunswick's mineral industry for over 50 years. Rising metal prices and the need to replace depleting reserves at the Brunswick mine have rejuvenated exploration for new deposits in the Bathurst mining camp.

The Bathurst Joint Venture (Falconbridge Limited and SLAM Exploration Ltd.) is in the third year of its exploration program in the Bathurst mining camp. The Bathurst Joint Venture is applying advanced technology to target potential mineralization at depths up to 300 m. Since the program began, some 300 geophysical anomalies have been identified of which 110 were prioritized as drill targets. A further 4236 line-km of airborne geophysics and 210 line-km of ground geophysics were conducted in the 2004/05 budget year to better define the targets. Between June 2004 and March 2005, a total of 63 drillholes were completed on these targets, including some beneath a cover of Carboniferous sedimentary rocks.

First Narrows Resources Corp. drilled two holes to test the centre of the feeder structure on the Chester property in the southwestern part of the Bathurst mining camp. Drillhole 16 intersected 3.6 m of 2.9% copper and Hole 17 cut 60 m of feeder zone grading 0.8% copper, including a 5.4-m intercept of 2.9% copper.

In 2005, SLAM Exploration Ltd. drilled 12 holes on its Nash Creek property located near Belledune in northern New Brunswick. This program resulted in a new discovery located 1600 m east of the known Hayes zone. Intersections in the new zone included 24.1% lead plus zinc and 56.1 g/t silver over 0.3 m, and 4.3% lead plus zinc and 15.5 g/t silver over 2.5 m. Mercator Geological Services Ltd. has recently calculated an indicated resource for the Hayes zone of 3.4 Mt grading 5.01% zinc, 0.89% lead and 30.95 g/t silver, and an inferred resource of 1.71 Mt grading 3.68% zinc, 0.66% lead and 19.20 g/t silver.

Abitex Resources Inc. is continuing its exploration program on its St. Stephen nickel-copper-cobalt property in southwestern New Brunswick. Hole SS-05-05 through the widest section of the Rogers Farm zone intersected 44.2 m grading 0.85% nickel, 0.69% copper and 0.06% cobalt.

Potash

Potash and salt mining has been an important contributor to the economy of southern New Brunswick since the early 1970s. The Potash Corporation of Saskatchewan (PCS) mine at Sussex currently produces about 750 000 t of potash chloride (KCl) and 800 000 t of sodium chloride (NaCl) annually. Additional potash resources were discovered in 2001 during joint-venture exploration with a junior hydrocarbon exploration company.

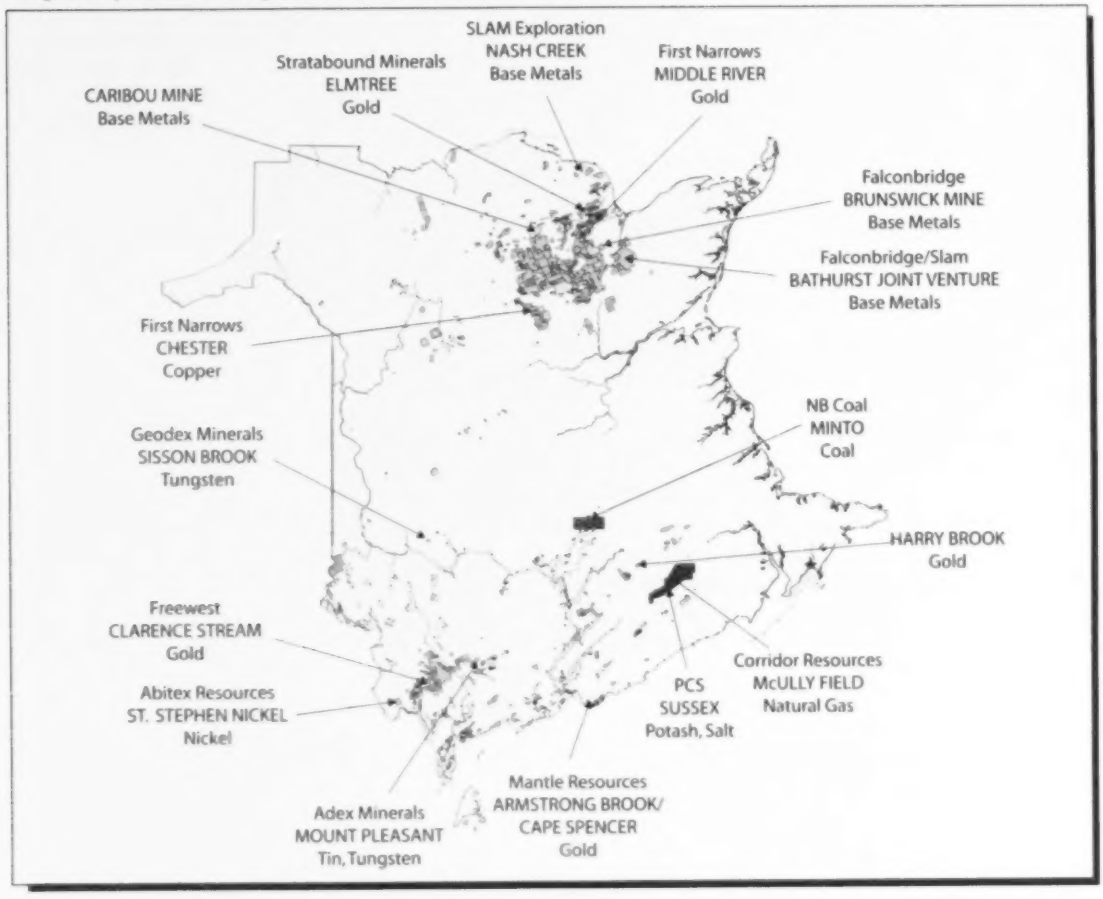
In late 2004 and in 2005, PCS drilled five exploration holes over a strike length of 10 km to delineate the extent of its recent potash discovery near Sussex. The new find is located along the southeastern flank of the existing potash deposit, discovered in 1971 under a cooperative federal-provincial geoscience program. A feasibility study on the possibility of developing the new deposit is in progress.

The major exploration projects in New Brunswick in 2005 are shown in **Figure 23**.

Provincial Exploration Initiatives

The Minerals, Policy and Planning Division of the Department of Natural Resources has offered three programs to stimulate exploration activity: the New Brunswick Junior Mining Assistance Program (NBJMAP), the New Brunswick Comprehensive Prospector Development Program (NBPDP), and the Advanced Exploration Program in the Bathurst Mining Camp. Between 2001 and 2005, the NBPDP and NBJMAP had an annual budget of $600 000 for a total of $2 400 000

Figure 23
Major Exploration Projects in New Brunswick, 2005



Source: New Brunswick Department of Natural Resources.

over four years; participation by prospectors and junior mining companies was high with grant uptake amounting to 97.6% of the allotted budget. The Advanced Exploration Program was introduced in 2003 to stimulate exploration for deeply buried base metals in the Bathurst mining camp. It has a budget of $2 500 000 per year for three years with a possible two-year extension.

New Brunswick Junior Mining Assistance Program (NBJMAP)

This program was developed as part of New Brunswick's effort to attract exploration investment into the Province. In 2005, ten junior mining companies received grants totaling $270 000.

New Brunswick Comprehensive Prospector Development Program (NBPDP)

This program was developed to encourage grass-roots exploration in New Brunswick. In 2005, 23 prospectors received Tier I grants for a total of $52 400 and 23 prospectors received Tier II grants for a total of $172 800.

Advanced Exploration Program

The Province of New Brunswick entered into a three-year agreement with Noranda Inc. (now Falconbridge Limited) in 2003 to share the cost of an Advanced Exploration Program in the Bathurst mining camp. The objective of this program is to identify new base-metal reserves prior to the expected closure of the Brunswick mine in a few more years. New Brunswick is contributing 50% of the funding up to a maximum of $2 500 000 per year. The application of advanced exploration technology under this agreement allows the identification of potential mineralization at a much greater depth than was previously possible.

Exploration Outlook

In 2006, New Brunswick should see exploration activity on par with 2005 levels.

Mining Highlights (2004)

Value of Production

The 2004 value of mineral production (including coal) in New Brunswick is estimated to be $759 992 409, representing an increase of 8% over the final value of $702 495 649 in 2003. The increase was due to a jump in the prices of both base metals and potash. The value of the Canadian dollar, at US76.98¢, was almost 8% higher than in 2003 when it averaged US71.58¢. The strengthening of the currency partly offset a rising trend in commodity prices.

The value of metals production during the year was $502 336 982, up 12% from 2003. The metals sector represents 66% of the province's value of mineral production. CanZinco's Caribou mine remained shut down for the sixth full year after low metal prices and metallurgical difficulties had forced a suspension of operations in August 1998. Noranda's Brunswick mine remained the province's sole metals producer, although production of the principal metals (zinc and lead) was down from the record levels of the previous year. As always, zinc dominated the metals sector with a value of $332 475 355, representing 66% of the total value of metals. The value of zinc production increased by approximately 2% from 2003. The average zinc price increased by 27% between 2003 (US37.54¢/lb) and 2004 (US47.53¢/lb), but the continued appreciation of the Canadian dollar was a significant offsetting factor. Lead production fell by almost 6%, but the price increased by more than 72% (US40.21¢/lb, up from US23.36¢/lb in 2003). Copper production was lower by 15%, but this was more than offset by a price increase of 61% (US130.0¢/lb in 2004 vs. US80.7¢/lb in 2003) for a total value of $29 467 151. Antimony, bismuth and cadmium continued to be produced as by-products from the Brunswick operation. The total value of the three by-product metals increased by almost 19%, mainly because of a substantial increase in bismuth production. A small drop in the amount of gold produced was more than offset by a 13% increase in its price. Silver production was practically unchanged, but the value increased on the strength of a 14% price increase.

The nonmetals sector of the industry contributed $193 188 761 (25%) to the value of mineral production, a 6% increase over the revised 2003 value. The largest contributor to the value of nonmetals production is potash. Despite a small decrease in production, higher prices resulted in a net increase in the value of potash. Peat, the second largest contributor ($50 781 530) to the value of nonmetals production, represented 26% of the sector's value. In 2004, the value of peat fell in tandem with the amount produced. Salt and sulphur in smelter gas ranked next in value of production with quartz and marl being minor contributors to the nonmetals sector.

The value of coal produced by N.B. Coal Limited in the Minto-Chipman area was lower by 34% ($11 266 000) as production fell by 36%.

The value of production for structural materials (lime, stone, sand and gravel) fell by 4% to $53 200 666. Sand and gravel production was down by 6% while stone production decreased by 2%. These commodities provide the raw materials for the construction industry in New Brunswick.

2.5 QUÉBEC[11]

A Destination of Choice for Mineral Exploration

Overview

For several years, the investment climate in Québec has been very conducive to mineral exploration. Exploration and deposit appraisal expenditures in Québec have remained above $225 million for two years, reaching $227.2 million in 2004 and $226.5 million in 2005 (preliminary data).

In 2004, most of these expenditures were allocated to off-mine-site work ($191 million, 84%) managed primarily by junior companies ($130 million) and senior companies ($52 million). Exploration and deposit appraisal activities focused mainly on gold ($135 million, 60% of all expenditures in Québec), as well as copper and zinc ($23 million, 10%) in northwestern Québec, nickel and copper ($34 million, 15%) in Ungava, and diamonds ($23 million, 12%) north of the Otish mountains.

Public financing (common and flow-through shares) raised on the Québec financial market in 2004 for exploration projects inside and outside Québec reached $132 million. This represents a 33% increase over 2003 and continues the trend toward revitalization of financing for mining that has been observed since 2002. However, the relative share of this financing directed toward projects in Québec (common and flow-through shares) actually decreased (see **Table 13**, which presents the financing raised in Québec for purposes of exploration in Québec only).

Exploration and Deposit Appraisal Highlights

A significant strengthening of the gold sector has been observed over the past few years with certain advanced projects completing significant steps. In Val-d'Or, Century Mining Corp. resumed commercial production at the Sigma open pit at the end of May and expects to produce 42 000 oz in 2005. Aurizon Mines Ltd. started sinking a shaft at the Casa Berardi project north of La Sarre and continued underground development work, as well as definition and exploration drilling. Mine production is expected to start in November 2006 at an annual rate of 175 000 oz of gold. In July, Agnico-Eagle Ltd. announced that it will proceed with the Goldex mining project, which has reserves of 21.77 Mt grading 2.4 g/t gold. The project represents a $176 million investment and construction will take place over a three-year period. Production is expected to begin in 2008 and amount to 170 000 oz per year.

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11 The Québec review of activities was prepared by Sylvain Lacroix, Jean Désilets, Pierre Marcoux, Roch Gaudreau, Lucie Ste-Croix and Jocelyne Lamothe. The exploration highlights were taken from the *Report on Mineral Exploration Activities in Québec 2005*. For more information, the reader is invited to contact Mr. Lacroix by telephone at (418) 627-6288 (ext. 5534) or by e-mail at sylvain.lacroix@mrnf.gouv.qc.ca.

TABLE 13. EXPLORATION FINANCING AND EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES IN QUÉBEC, 1999-2004

	1999	2000	2001	2002	2003	2004
			($ millions)			
Flow-through share issues	5.9	10.2	10.0	14.6	19.2	21.1
Common share issues and debentures	. .	15.3	19.8	22.6	42.2	20.4
Exploration and deposit appraisal expenditures	113.5	94.1	102.9	111.2	134.0	227.2

Source: Québec's Ministère des Ressources naturelles et de la Faune.
. . Not available.

Underground evaluation work began or continued at several advanced gold exploration projects. Agnico-Eagle Mines Ltd. has begun an estimated $30 million project on the Lapa property near Cadillac, with underground development to continue after the sinking of an 823-m shaft. Probable reserves are estimated at 4.08 Mt grading 8.91 g/t gold. Near Malartic, Richmont Mines Inc. invested over $10 million in its East Amphi property to continue underground development work and complete a bulk sampling program of 25 900 t. At the Kiena mine complex, Westdome Gold Mines Inc. carried out definition drilling in the VC, 388, Nord and Martin zones and completed two exploration drifts at its Kiena/Wesdome project. In September 2005, Alexis Mineral Corporation started the excavation of a 1.5-km ramp and the drilling of an 18 000-m program at the Lac Herbin project near Val-d'Or in order to verify inferred resources estimated to date at 1.07 Mt grading 7.3 g/t gold.

Interesting results were also announced for other gold exploration projects in Abitibi. At the Wood-Pandora property, a few kilometres west of the Lapa project, Globex Mining Enterprises Inc. and Queenston Mining Inc. intersected a zone of mineralization assaying 25.35 g/t gold over 6.0 m. At the Bachelor Lake project near Desmaraisville, Metanor Resources Inc. and Halo Resources Ltd. completed underground drilling and produced a new estimate of measured and indicated resources at 0.84 Mt grading 7.79 g/t gold. On the Windfall Lake property, in the Urban-Barry Belt east of Lebel-sur-Quévillon, drilling by Noront Resources Ltd. intersected a stockwork of gold-bearing veinlets assaying 5.9 g/t gold over 7.05 m. While drilling an adjacent property, Murgor Resources Inc. intersected high-grade gold mineralization (e.g., 10.46 g/t gold over 11 m).

The James Bay region has been attracting increasing interest in gold since the discovery by Virginia Gold Mines Inc. of the Roberto mineralized system on the Éléonore property northeast of the Opinaca reservoir. This highly gold-rich system, that has now been traced by drilling over 1.9 km laterally and to a vertical depth of 900 m, contains three main zones–Roberto (22.56 g/t gold over 15 m), Mid-Roberto (13.35 g/t gold over 10.8 m and 11.11 g/t gold over 5.1 m) and Roberto Est (11.23 g/t gold over 10.8 m)–that are open laterally and at depth. Virginia Gold Mines also announced the signature of an agreement with Goldcorp Inc., which will purchase the Éléonore project through an approved plan of arrangement. Goldcorp plans to actively pursue exploration and development of the project in 2006. An initial estimate of mineral resources is expected by the summer of 2006. This significant discovery in a new geological setting has led to a reassessment of the gold potential of the region. Everton Resources Inc. and Exploration Azimuth Inc. have announced the discovery of a 1.7-km-long gold-bearing trend on the "A Block" of the Opinaca property, adjacent to the north side of the Éléonore property of Virginia Gold Mines Inc. Selected surface samples yielded grades ranging from 0.1 to 29.07 g/t gold in highly metamorphosed sedimentary rocks.

With regard to base metals, significant progress was made in certain advanced projects in northwestern Québec, compensating somewhat for the impact of the closure of the Bouchard-Hébert and Louvicourt mines. By September 2005, Campbell Resources' Copper Rand 5000 mine had produced 3.6 million lb of copper and 3944 oz of gold. Additionial workings will have to be developed in order to reach commercial production levels. In the fall, Breakwater Resources Ltd. announced the development near Lebel-sur-Quévillon of the former Langlois mine (zinc, silver, copper), which is expected to go into production in 2007.

There are also promising results to report for several copper and zinc exploration projects. In March, Falconbridge Ltd. and Alexis Mineral Corporation announced a significant discovery in the Rouyn-Noranda mining camp where an intersection yielded 3.35% copper, 1.3% zinc and 1.86 g/t gold over 45.7 m. An initial resource estimate is expected in 2006, although the depth potential has not yet been tested. At the Louvex project near Val-d'Or, 1 km from the former Louvicourt mine, Alexis Mineral Corporation and Novicourt Inc. intersected an altered zone and stringer sulphide mineralization over a width of 235.9 m, including a 12.4-m section grading 1.48% zinc. Near Chibougamau, COGITORE Resources completed nine drillholes in the host sequence of the former Lemoine mine where a 3-m interval returned a grade of 3.20% zinc and 0.31% copper. Campbell

Resources Inc. also obtained good results in several drillholes targeting the extension of the Corner Bay deposit at depth, including a 16.10-m interval grading 9.27% copper.

North of the Otish mountains, Ashton Mining of Canada Inc. and SOQUEM INC. continued drilling in the diamond-bearing kimberlite bodies Renard 2, 3, 4, 7, 8, 9 and 10, and in the Lynx diamond-bearing kimberlite dikes. In April, an estimate based on 459 ct of diamonds from a bulk sample of 664 t, collected in 2004 at Renard 2, 3, 4 and 65, returned a modeled value of US$88/ct. During the summer, the work of these companies led to the discovery of an important kimberlite dike (Hibou) and several kimberlite erratics scattered between the Renard swarm and the Lynx dike system. In November, the joint venture announced that Renard bodies 2, 3, 4 and 9 could potentially contain from 18.6 to 22.0 Mct of diamonds in 23.2 to 27.5 Mt of kimberlitic material.

Interesting nickel discoveries continued to be made in the Ungava belt of the Northern Québec region. Canadian Royalties Inc. discovered two new zones (Ivakkak and Tootoo West). The Ivakkak zone returned average grades of 3.3% nickel, 3.6% copper, 1.6 g/t platinum and 4.9 g/t palladium over a 9.5-m interval, but one intersection graded 1.76% nickel, 2.11% copper and 3.95 g/t platinum and palladium over 22.5 m. The Tootoo West zone graded 1.10% nickel, 1.06% copper and 6.51 g/t platinum plus palladium plus gold over 19 m, with a 2.88-m interval at 31.02 g/t palladium plus platinum. Total resources on the Canadian Royalties' Raglan South nickel project are estimated at over 10 Mt spread over several deposits. Knight Resources Ltd. and Anglo American Exploration (Canada) Ltd. also made a new discovery on the Raglan West project. Two intersections of interest were made in the Century zone of the Greater Frontier area, returning 2.16% nickel over 7.8 m and 3.37% nickel over 1.4 m. Anglo American Exploration (Canada) Ltd. and Goldbrook Ventures Inc. reported the discovery of two nickel-copper-platinum-palladium showings on its Belanger property: the Pad1/R2 zone, with grades of 0.85% nickel, 1.49% copper, 1.14 g/t palladium and 0.14 g/t platinum over 24.73 m; and the Timtu zone, with grades of 1.01% nickel, 0.63% copper, 1.81 g/t palladium and 0.57 g/t platinum over an 8.65-m interval. Falconbridge Ltd. also identified the next sector to be developed at the Raglan mine: Zone 5-8, located 5 km east of the Katinniq mill and concentrator. A 44.65-m intersection of Lens 8H returned grades of 3% nickel and 0.94% copper.

In the Grenville Province, Exploration Esbec Inc. discovered a new showing north-northwest of Forestville where selected samples returned grades of up to 1.40% nickel. Near Mont-Laurier, Quinto Technology Inc. obtained channel samples from a trench that yielded average grades of 2.22% over 6.45 m. Matamec Exploration Inc. drilled three holes to test the northern extension of the former Renzy Lake mine. The best values obtained were 1.01% nickel and 1.24% copper over 14.7 m. North of Port-Cartier, two prospectors discovered a uranium showing associated with pegmatites and pink granites for which selected samples returned values of 2920 ppm uranium and 995 ppm thorium.

In the Gaspé, on the Lac Arsenault property, Ressources Appalaches Inc. followed the Baker gold-bearing quartz vein over a distance of 80 m and to a depth of 90 m. Values of 7.4 g/t gold and 74.3 g/t silver were returned over 0.5 m. In drilling on the Mont-de-l'Aigle property, the company found brecciated stockworks containing pyrite, chalcopyrite, hematite and magnetite with mineralized intervals up to 60 m thick grading roughly 0.2% copper. In the Lower St. Lawrence region, in drilling on its Sainte-Marguerite property, Puma Exploration Inc. confirmed the presence and continuity of two mineralized zones containing sub-horizontal quartz-bearing veins over distances of 35 and 70 m, respectively. The best intersections of these zones to date carry gold values ranging from 1.6 g/t over 0.3 m to 40.8 g/t over 0.2 m.

In terms of architectural stone, A. Lacroix et Fils Granit Ltée and Granijem Inc. continued the development of various deposits at Saint-Alexis-des-Monts and north of Saint-Ludger-de-Milot, respectively, as well as north of Baie-Comeau and near the Manic 3 hydro-electric dam. At Saint-Mathieu-de-Rioux, Les Pierres Saint-Mathieu Inc. started quarrying a red sandstone for use as landscaping stone and in masonry. There were over 15 exploration projects for slate and marble, a situation that has not been seen in Québec in decades.

In the industrial minerals sector, Junex Inc. completed drilling of a new well in Bécancour and increased its natural brine production capacity. In the Murdochville area, Exploration Orbite has acquired the rights to the Grande-Vallée red clay deposits, which contain minerals that are in demand by aluminum smelters, cement plants and manufacturers of refractory products.

In view of the high price of metals (gold, copper, nickel, iron, uranium) and the recent significant discoveries of various materials in Québec, the level of exploration and deposit appraisal activities should remain the same in 2006 as in the past two years. Once again, exploration expenditures should be highest in Abitibi and Ungava, but increasing investments can be expected in other sectors in Québec, including gold and diamonds in the James Bay area.

Comparative Advantages and Recent Provincial Initiatives

Québec has had one of the most favourable mineral exploration investment climates in the world for the past five years. Here are the main factors contributing to Québec's excellent exploration investment climate.

A Rich and Diverse Mineral Potential in a Vast, Open, Little-Explored Territory

Because of the richness of its subsoil, Québec ranks second in Canada in terms of mineral production value. Its mineral wealth is particularly diverse, as illustrated by the production of some 30 mineral commodities in the province. Québec also ranks as a significant producer of iron, nickel, gold, copper, zinc, niobium, ilmenite and titanium dioxide. Discovery prospects are extremely attractive, as illustrated by the development of numerous major deposits in the past 100 years, including the Raglan and LaRonde deposits in the last decade.

Québec has a land area of more than 1.5 million km^2. Over 90% of Québec consists of Precambrian rock, which is known worldwide for hosting many world-class deposits. Even after the recent wave of claim staking for diamonds, the area of more than 6 million hectares (Mha) covered by claims represents less than 5% of Québec's landmass; consequently, a vast area remains open to exploration. Furthermore, Québec is blessed with favourable geography and possesses a well-developed infrastructure that provides ready access to its land by road, rail, water or air.

Abundant and Accessible Geoscientific Information

In Québec, the geoscientific data acquired by government and industry for over 100 years are found in SIGEOM, the province's geomining information system. It contains no fewer than 5200 Québec Department of Natural Resources, Wildlife and Parks (MRNFP) publications and 62 500 reports produced by mining companies, for a total of 2.3 million pages, 295 000 geological plans and maps, 6800 mineral occurrences, 129 400 diamond drillholes, and 12 million geochemical analysis results obtained from 625 000 samples. The information in this database is valued at over $5 billion and it is constantly being updated and improved.

This geoscientific database is easy to access, particularly with the SIGÉOM à la carte interface (www.mrnf.gouv.qc.ca/mines/index.jsp). SIGEOM allows all of its mining clientèle to access and consult the data on the Internet at any time, from anywhere, and to download, customize and order them through e-commerce.

Geoscientific Knowledge Acquisition and Processing

To open northern Québec up to mining exploration, the Géologie Québec branch of the Québec Department of Natural Resources and Wildlife (MRNF) conducted, between 1995 and 2003, two of the most extensive geological mapping programs in Canada. Under the Moyen-Nord and Grand-Nord programs, 80 new geological maps (at scales of 1:50 000 or 1:250 000) covering an area of close to 400 000 km^2 were produced. In 2005, the data collected during the Grand-Nord program

were the subject of no less than eight syntheses. Four others were also prepared for northwestern Québec and a further four were prepared for the Grenville Province.

In 2005, the MRNF (Géologie Québec) did not conduct any inventory work, per se, although reconnaissance exploration produced an inventory of quarries and aggregate resources in the Chaudière-Appalaches and national capital regions. Eleven compilation and ground-truthing projects were also carried out in various regions of Québec in 2005.

Renewal of mining reserves continued to be a priority concern for the industry and the MRNF. The situation is particularly glaring in the case of copper in northwestern Québec because of the importance of supplying the Horne smelter with copper concentrate from the region. An assessment was therefore carried out of the mineral resource potential of the porphyry copper deposits in the Abitibi sub-province.

Géologie Québec also produced gold potential assessment maps by processing georeferenced data for the sub-province of Abitibi and for the Frotet-Evans belt. Some 130 maps at a scale of 1:50 000 will be distributed in March 2006 and will suggest over 300 new exploration targets to mining companies.

The first results of this work were unveiled in November at the Québec Exploration 2005 congress, which attracted more than 1300 participants in the exploration field from all parts of Canada and elsewhere.

A Reliable, Modern Mining Regime

The Québec mining regime is based on the *Mining Act* and is founded on the principle of free mining, i.e., universal access to the resource. Mining titles are now being obtained from map designations, according to predefined boundaries. Titles, together with exclusive rights to search for all state-owned mineral commodities (with the exception of sand, gravel, clay and other superficial deposits) and a guarantee to receive a mining title in the case of a discovery, are awarded on a first-come, first-served basis. This approach has the advantage of being fast and simple; it also makes the claim indisputable by a third party and protects investments in the claim.

The average cost of acquiring a new designated claim of an average area of 50 ha is $80. This is a real financial boon to explorationists, since the former costs required for staking out and registering a similar area amounted to over $500. Consequently, the acquisition of claims in Québec via map designation is, on average, close to seven times less expensive for the industry compared to the old method of ground staking.

The new interactive transactional web-based mining title management interface (GESTIM Plus) offers instantaneous, continuous, any time and anywhere access to the public register of real and immovable mining rights at https://gestim.mines.gouv.qc.ca. GESTIM Plus enables users to consult the register and to designate and register mining exploration titles on-line, renew titles, and pay fees through e-commerce.

One of the Lowest Net Exploration Costs in the World

Québec offers several tax incentives that significantly reduce the net cost of exploration for mining companies in Québec and promote the financing of their activities (www.mrnf.gouv.qc.ca/mines/fiscalite/index.jsp).

Under the *Taxation Act*, the Québec government introduced the tax credit for resources (CIRR) in 2001. This mechanism provides direct assistance to mining companies that incur eligible exploration expenses in Québec, unlike the flow-through-share regime in which companies give up the right to deduct eligible expenses to an investor. Part of this tax credit is refundable and part is non-refundable.

With respect to the refundable portion, eligible exploration costs incurred after March 30, 2004, may give rise to an entitlement of 35% of the costs incurred by companies that are not mining a mineral resource or 15% of the costs incurred by companies engaged in mining activities. These rates are higher (38.75% and 18.75%, respectively) for costs incurred in Québec's Near North or Far North.

In addition to the refundable portion, a non-refundable portion can be applied, where applicable, to reduce the income tax and capital tax that a company must pay in Québec. The rate for the non-refundable portion can amount to a maximum of 10% of the eligible costs incurred by companies that are not producing (a mineral resource) and 30% of the costs incurred by producing companies. These rates are lower (6.25% and 26.25%, respectively) for costs incurred in Québec's Near North or Far North.

Eligible companies must be active and have a place of business in Québec. The eligible expenditures for the purpose of calculating the tax credit are those that give rise to an entitlement to a deduction of at least 125% under the current flow-through-share regime. This credit is taxable under the *Taxation Act* and the *Mining Duties Act*. Companies have the option of using this credit or the flow-through-share financing program.

In addition, the credit on duties refundable for losses provided under the *Mining Duties Act* is equal to 12% of the lesser of two amounts: the annual loss, or the exploration, deposit appraisal and mine development expenses. The credit is increased to 15% if the exploration expenses have been incurred in Québec's Near and Far North and the tax credit for resources has not been claimed for the expenses. The credit on duties refundable for losses is non-taxable and does not reduce the amount of exploration expenses that a mining company can claim under the *Mining Duties Act* and the *Taxation Act*. Since 2003, however, it is taxable under the federal *Income Tax Act*.

An additional deduction of 50% of qualifying exploration expenses may also be granted under the *Mining Duties Act*, up to a limit of 50% of annual profit. Eligible expenses include surface exploration and underground drilling work performed on land that is not under a mining lease or mining concession, or where no extraction work has been carried out in the previous five fiscal years.

Access to Public Funding, Venture Capital and Exploration Partners

The *Québec Taxation Act* enables a Québec taxpayer (individual) to claim a substantial tax deduction for his or her investment in flow-through shares. The Québec regime allows for a base deduction equal to 100% of the costs of flow-through shares. For shares acquired since March 31, 2004, individuals may deduct an additional 25% when the exploration costs are incurred in Québec by a company not engaged in the mining of mineral resources. A further 25% may be deducted if the exploration is done from the surface, bringing the total deduction to 150% of the cost of the investment.

Another amendment with respect to flow-through shares has been in force since March 31, 2004. Upon the sale of shares, an investor may benefit from an exemption on the capital gain realized on the portion of the sale price between the cost of acquiring the shares and their adjusted cost base, which is deemed to be zero.

For the 2004 taxation year, taking Québec and federal tax benefits into account, the net cost of a $1000 investment in flow-through shares totals some $284 for a Québec individual at the highest marginal tax rate.

Several venture capital funds are dedicated to companies involved in mineral exploration in Québec. The mission of SIDEX (Société d'investissement dans la diversification de l'exploration [exploration diversification investment corporation]) (www.sidex.ca), a limited partnership created in 2001, is to invest in the capital stock of companies with exploration projects that will lead to the diversification of the Québec mining industry, both in terms of commodities extracted and in terms

of mineral-producing regions. The initial capital for SIDEX was set at $50 million and was provided by its two limited partners, the Québec government (70%) and the Solidarity Fund QFL (30%). In 2004, SIDEX made 22 investments totaling $5.4 million.

SODÉMEX (Société de développement des entreprises minières et d'exploration [mining and exploration company development corporation]) and SODÉMEX II made 22 investments in 2004, injecting a total of $4 million into exploration projects primarily in Québec. SODÉMEX and SODÉMEX II are limited partnerships held by Capital d'Amérique CDPQ and SGF Minéral Inc. They participate in the development of the mining industry in Québec by investing in junior exploration companies and mining producers with activities in Québec whose market capitalization is below $125 million. These companies are also active on the secondary market and have become important financial backers for exploration in Québec. Some $44 million in capital is provided by the partners. The investment portfolio of these companies is managed by Gestion SODÉMEX.

SOQUEM Inc. (Société québécoise d'exploration minière), which is owned by SGF Minéral Inc., and its partners have historically committed over $10 million to off-mine-site exploration work in Québec. This amount excludes recent expenditures on diamond exploration by partners Ashton Mining of Canada Inc. and SOQUEM Inc. in the northern part of the Otish mountains.

In addition to its participation in SIDEX, the Solidarity Fund QFL (www.fondsftq.com/internet-fonds.nsf/AccueilAn_flash?OpenPage) invests in mining companies and mineral exploration companies primarily through the Nord-du-Québec Regional Solidarity Fund QFL and the Abitibi-Témiscamingue Regional Solidarity Fund QFL. In 2004, these funds invested approximately $2.2 million in capital and debentures in some 10 Québec exploration companies in support of their exploration projects or working capital requirements.

Lastly, the Québec Department of Natural Resources and Wildlife continued to encourage Aboriginal communities in the Near and Far North to participate in the development of the mineral potential of this vast area. To that end, a budget of $0.3 million was granted in 2005/06 to each of the following three Aboriginal mining funds: the Cree Mineral Exploration Board, the Fonds d'exploration minière du Nunavik (Nunavik mining exploration fund), and the Fonds minier Innu Nitassinan (Nitassinan Innu mining fund).

2.6 ONTARIO[12]

Ontario – Exciting Exploration Opportunities

Ontario remains the prime mineral investment jurisdiction in Canada as its world-renowned geology and mineral endowment, favourable taxation, access to skilled labour, and stable regulatory environment that supports sustainable development practices continue to garner favour with investors. The Ontario Geological Survey (OGS) maps, documents and promotes Ontario's geology and mineral endowment and mineral investment opportunities. Many of the exciting exploration highlights summarized are the result of mineral industry exploration decisions based on the foundation of independent and credible OGS geological maps and staff recommendations. New mine openings, a wide variety of minerals being sought, and a number of exciting mineral resource exploration projects are combining to make Ontario a great place to explore and to develop Ontario's mineral wealth.

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12 The Ontario review of activities was prepared by staff of the Ministry of Northern Development and Mines. For more information, the reader is invited to contact Brock Greenwell by telephone at (705) 670-5620 or by e-mail at brock.greenwell@ndm.gov.on.ca.

Overview

Gold remains the primary focus of the exploration industry in Ontario, but spending on diamonds and base metals has climbed significantly over the past few years. Exploration spending soared to over $300 million in 2004 and has remained close to historical highs. This is attributable to higher prices for most of the primary metals and industrial minerals, and to the availability of capital with the super flow-through-share program.

Preliminary estimates for 2004 indicate that the total value of Ontario's mineral production in the two commodity groups (metals and nonmetals) was $7.2 billion. This represents a 27% increase from the $5.7 billion reported in 2003. The contribution of each commodity group to the 2004 Ontario total was $4.8 billion (66%) for metallic minerals and $2.5 billion (34%) for nonmetallic minerals. In 2004, Ontario produced 38% of Canada's metallic minerals and 24% of Canada's non-metallic minerals. **Figure 24a** shows Ontario's active mines in 2005.

The five highest-value metallic minerals produced in Ontario during 2004 were nickel ($2133 million), gold ($1225 million), copper ($660 million), platinum group metals ($415 million), and zinc ($113 million). Combined these represent 97% of the total value of Ontario's metallic mineral production in 2004.

In 2004, Ontario yielded 64% of Canada's nickel production, 64% of its gold production, 33% of its copper production and 90% of its platinum group metals (PGMs) production.

Ontario retained its position as the lead Canadian province in the value of non-fuel mineral production as the value of metal production soared to $4.8 billion in 2004 from $3.4 billion in 2003. A 75% rise in the value of nickel production, as well as dramatic increases in the value of copper, zinc and PGMs, helped offset a slight decline in the value of gold. In 2004, Ontario accounted for 32% of Canadian non-fuel mineral production.

Revised spending intentions for 2005 indicate that the meteoric rise in spending will continue as Ontario's $337 million will lead all Canadian provinces and territories in exploration and deposit appraisal expenditures and account for 25% of Canada's total expenditures. Final exploration and deposit appraisal expenditures for 2004 totaled $307 million, up significantly from the $219 million recorded in 2003.

Spending intentions for 2004 indicate a total of $620 million was spent on mineral exploration, deposit appraisal and mine complex development in Ontario. Total expenditures by activity in 2004 were $247 million (40%) for exploration, $60 million (10%) for deposit appraisal, and $313 million (50%) for mine complex development. Forecasts for 2005 mineral exploration and deposit appraisal expenditures, including mine complex development, are estimated at $696 million. The increase is attributable to increases in each of the three types of work.

In 2004, spending by Ontario's junior mining companies almost doubled to $141 million from $71 million in 2003. Senior mining companies also benefited from higher metal prices and increased their spending by 12% to $166 million. Revised spending intentions for 2005 indicate that Ontario's junior and senior companies will both increase spending.

Gold continues to be the most-sought-after commodity in Ontario despite significant increases in activity around diamonds and base metals. Much of the increase in exploration expenditures during 2003 was due to more activity around existing gold mines and known deposits.

The number of mining claims in good standing in Ontario reached record levels during 2005 as they exceeded 200 000 for the first time. Assessment work in Ontario climbed in 2004 as the value of the work went from $41 million in 2003 to $65 million in 2004.

Figure 24a
Ontario Mining Operations, 2005

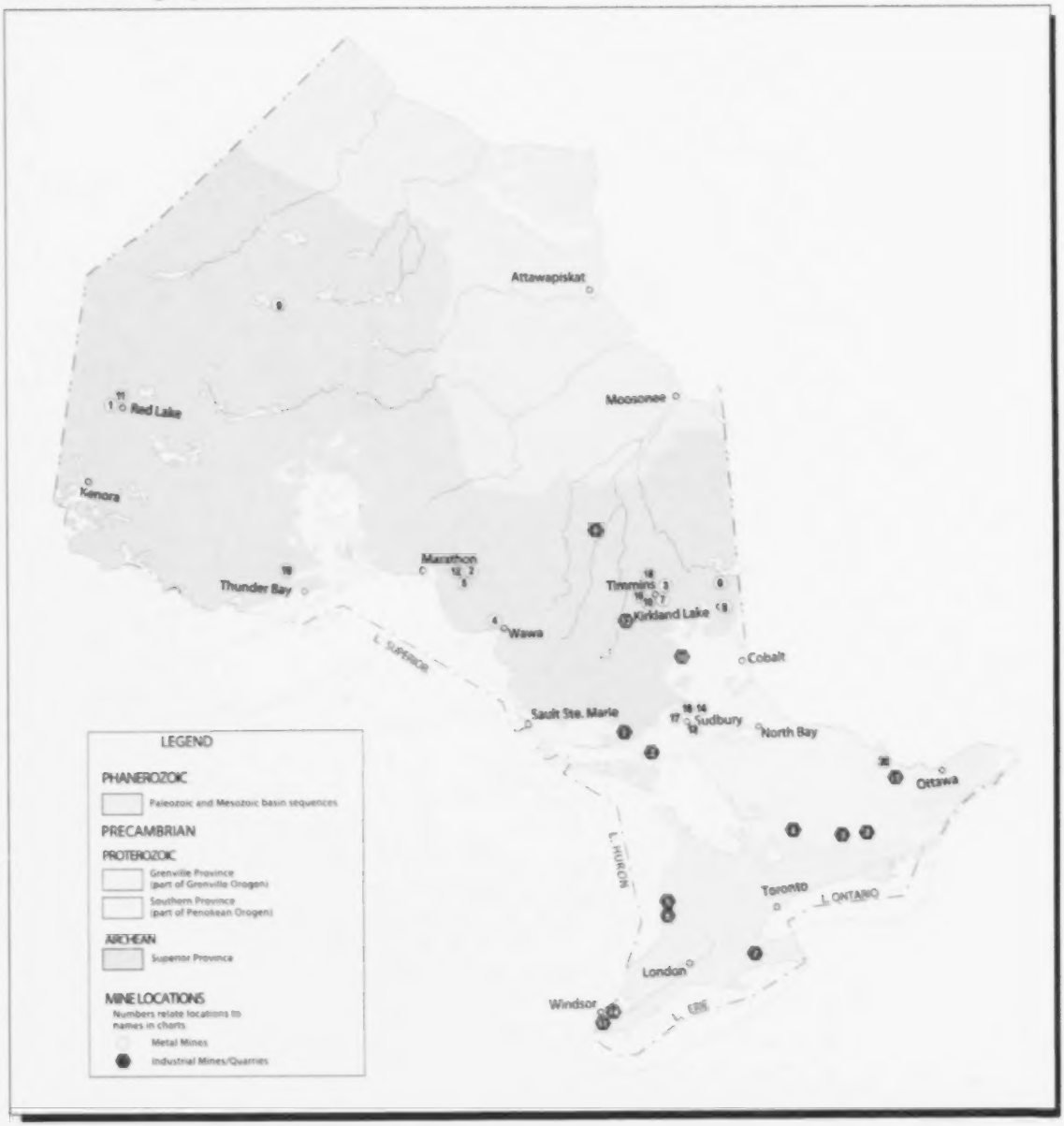


Figure 24a
Ontario Mining Operations, 2005

Figure 24a (cont'd)

GOLD MINES

1.	Campbell	Placer Dome Canada Ltd.
2.	David Bell	Teck Cominco Limited, Barrick Gold Corporation
3.	Dome	Porcupine Joint Venture
4.	Eagle River	River Gold Mines Ltd.
5.	Golden Giant	Newmont Mining Corporation of Canada Limited
6.	Holloway	Newmont Mining Corporation of Canada Limited
7.	Hoyle Pond	Porcupine Joint Venture
8.	Macassa	Kirkland Lake Gold Corporation
9.	Musselwhite	Placer Dome Canada Ltd.
10.	Pamour	Porcupine Joint Venture
11.	Red Lake	Goldcorp Inc.
12.	Williams	Teck Cominco Limited, Barrick Gold Corporation

BASE-METAL MINES (NICKEL, COPPER, ZINC, LEAD)

13.	Fraser	Falconbridge Limited
	Onaping/Craig	Falconbridge Limited
	Lindsley	Falconbridge Limited
14.	Copper Cliff North	INCO Limited
	Copper Cliff South	INCO Limited
	Creighton	INCO Limited
	Garson	INCO Limited
	Gertrude	INCO Limited
	McCreedy East	INCO Limited
	Coleman	INCO Limited
	Stobie	INCO Limited
15.	Kidd Creek	Falconbridge Limited
16.	Lockerby	First Nickel Inc.
17.	McCreedy West	FNX Mining Company Inc., Dynatec Corporation
18.	Montcalm	Falconbridge Limited

PLATINUM GROUP METAL MINES

19.	Lac des Iles	North American Palladium Ltd.

OTHER METAL MINES (MAGNESIUM, CALCIUM, STRONTIUM)

20.	Timminco Metals	Timminco Ltd.

MAJOR INDUSTRIAL MINERAL OPERATIONS

1.	AMP Quarry (carbonatite)	Agricultural Mineral Prospectors Inc.
2.	Badgeley Island Quarry (silica)	Unimin Canada Ltd.
3.	Blue Mountain Operations (nepheline syenite)	Unimin Canada Ltd.
4.	Cavendish Twp. (vermiculite)	Regis Resources Inc./Canadian Vermiculite
5.	Goderich Brine Field (salt)	Sifto Canada Inc.
6.	Goderich (salt)	Sifto Canada Inc.
7.	Hagersville (gypsum)	CGC Ltd.
8.	Henderson (talc)	Dynatec Corporation – Canada Talc Division
9.	Kapuskasing Phosphate Operations (phosphate)	Agrium Inc.
10.	North Williams (barite)	Extender Minerals of Canada Ltd.
11.	Ojibway (salt)	The Canadian Salt Company Limited
12.	Penhorwood (talc)	Luzenac Inc.
13.	Tatlock Quarry (calcium carbonate)	OMYA (Canada) Inc.
14.	Windsor Brine Field (salt)	The Canadian Salt Company

Source: Ontario Ministry of Northern Development and Mines.

Spotlight on Diamonds

Ontario has a long history of diamond exploration (see spending for the 1998-2005 period in **Figure 24b**). Diamond discoveries date back to the last century when diamonds found in glacial deposits in southern Ontario were suspected to come from northern Ontario. However, very little diamond exploration occurred until recently when companies began to widen their search.

The Precambrian Shield, which underlies most of northern Ontario, displays all the characteristics favourable to kimberlite discoveries. Explorers have unearthed a number of kimberlites containing diamonds throughout Ontario and diamond exploration has increased dramatically since their discovery. The areas of interest include: the North Bay/Cobalt/Kirkland Lake corridor, Wawa to Kapuskasing and north, Marathon to Geraldton, the James Bay Lowlands, and the far northwestern part of Ontario near the Manitoba border. Exploration for diamonds in Ontario continues to accelerate every year, reaching $45 million in 2005. The current diamond exploration in Ontario is focused in the James Bay-Hudson Bay Lowlands, the Wawa region, and from Cobalt to Kirkland Lake.

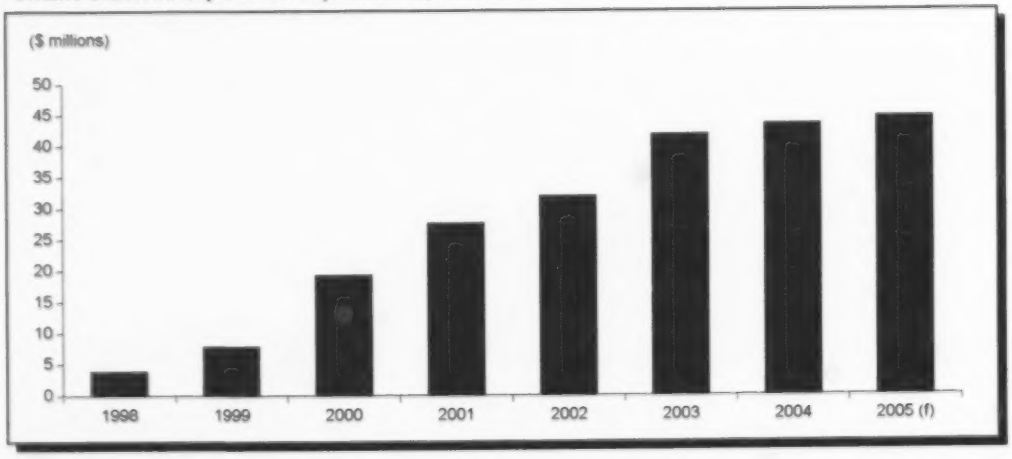
Some of the diamond projects in Ontario worth noting are:

The James Bay Lowlands area of Ontario is home to De Beers Canada's Victor project where 18 kimberlite pipes were discovered, 16 of which are diamondiferous. Construction on the $1 billion-capital-cost mine will commence in 2006. The project is by far the largest investment in Ontario's Far North. When it opens in 2007, it will be Ontario's first diamond mine and should reach full production in 2008. The mine will be an open-pit operation with an expected life of 12 years and a total project life of 17 years (www.victorproject.com and www.debeerscanada.com).

In the northeast corner of Savard Township, Tres-Or Resources Ltd. and Arctic Star Diamond Corp. discovered a kimberlite pipe referred to as the Lapointe. A magnetic anomaly, over the pipe, covers 20 ha on surface. A total of 31 diamonds have been recovered, the largest weighing 0.0665 carats (ct). A 3500-m drilling program is under way (www.tres-or.com).

Contact Diamond Corporation discovered another kimberlite pipe, named MR8, at its Timiskaming diamond project in Hudson Township. The new pipe is located 15 km from the town of New

Figure 24b
Ontario Diamond Exploration Expenditures, 1998-2005



Source: Ontario Ministry of Northern Development and Mines.
(f) Forecast.

Liskeard and 6 km from Contact Diamond's diamondiferous 95-2 pipe in Lundy Township. Eighteen holes totaling 2650 m were completed on the KL01 pipe in Van Nostrand Township and 23 holes totaling 3960 m were completed on the KL22 pipe in Klock Township. An updated valuation of the diamonds recovered from the 95-2 pipe, completed on 64 ct, is US$48.50/ct (www.contactdiamond.com).

Metalex Ventures Ltd. and Arctic Star Diamond Corp. commenced a mini-bulk sampling program on the newly discovered TI kimberlite in the James Bay Lowlands. A total of 1573 kg of kimberlite was processed and 288 diamonds were recovered, including 45 macrodiamonds (www.metalexventures.com and www.arcticstardiamond.com).

An aggressive exploration program by Dianor Resources Inc. on its diamond property at Wawa is targeting an Archean conglomerate interpreted as a sedimentary diamond deposit in a submarine basin. A 145.09-kg sample of drill core returned 616 diamonds. Two mini-bulk samples were collected from the diamondiferous unit. An 800-t sample of modern alluvium was collected to test the diamond potential of the surficial deposits (www.dianor.com).

At the Festival property in Wawa, Pele Mountain Resources completed a diamond-drilling program on the Deutz and Dom Perignon occurrences. A 238.6-kg sample from whole drill core collected at the Dom Perignon returned 1227 diamonds. A bulk sampling program targeted the Cristal occurrence and the Deutz occurrence (www.pelemountain.com).

Spider Resources Inc. and KWG Resources Inc. announced that a 0.33-ct diamond was recovered from one of the bulk samples collected on their Wawa property. The partners are developing a recovery-process scoping application that will most effectively separate the highly diamondiferous xenolithic nodules from the diamond-barren host rock (www.spiderresources.com).

Metalex Ventures Ltd. announced the discovery of a diamond-bearing kimberlite, designated the T1, located approximately 80 km west of the De Beers Canada Inc. diamond mine project in the James Bay Lowlands. Sampling of kimberlite obtained from two drillholes yielded 288 diamonds from 1573 kg of kimberlite. Forty-five of the diamonds exceeded 0.5 mm in one dimension.

Superior Diamonds Inc. initiated a diamond-drilling program in the Neskantaga (Lansdowne) area of northwestern Ontario. The program is a follow-up to a multi-year program of reconnaissance-scale overburden sampling and a high-sensitivity airborne magnetic survey. The property covers numerous magnetic anomalies within the Stull-Wunnammin fault zone (www.superiordiamonds.ca).

Gold

Lake Shore Gold Corp. continues to expand resources at its Timmins West gold property. Recent significant intersections from the Ultramafic zone include 9.28 g/t gold (cut) over 24.35 m, including 17.76 g/t gold (cut) over 6.8 m and 4.55 g/t gold (cut) over 10.40 m, which includes 24.79 g/t gold (cut) over 1.50 m. Pre-feasibility studies on the property are under way (www.lsgold.com).

By the end of the third quarter of 2005, Richmont Mines Inc. had invested $8.75 million in its advanced exploration program at the Island Gold property near Wawa. Underground development included the extension of the ramp to a vertical depth of 235 m and a 10 000-m underground diamond-drilling program (www.richmont-mines.com).

Trade Winds Ventures Ltd. continues to investigate the near-surface potential of the M zone structure at the Block A Detour Lake property. Over 50 000 m of diamond drilling will be completed by the end of 2005. Significant intersections include 20.88 g/t gold over 9.7 m and 384.12 g/t gold over 2.0 m (www.tradewindsventures.com).

On the Detour mine property, Pelangio Mines Inc. completed a 10 000-m drill program to evaluate near-surface resources. A new mineral resource includes 2.5 Mt at 2.00 g/t gold indicated and 23.4 Mt at 2.29 g/t gold inferred (www.pelangio.com).

Vedron Gold Inc. and Laurion Gold Inc. announced the discovery of a new gold-bearing zone below a depth of 200 m at the Davidson-Tisdale mine property. Results from the recent drill program included assays of 17.28 g/t gold over 2.5 m and 12.83 g/t gold over 7.5 m (www.vedron.com and www.lauriongold.com).

In 2005, Valgold Resources Ltd. drilled 14 diamond drillholes totaling 3523 m at the Tower Mountain property in Conmee Township. The purpose of the holes was to further define the 4/36 and U-V zones on the property. All the holes intersected broad areas of alteration and gold mineralization (www.valgold.com).

Wolfden Resources Inc. now controls all of the highly prospective Bonanza-Follansbee property, having acquired Sabina Resources' 60% interest in the Follansbee portion of the package. Drilling of 96 holes focussed on three zones that display vertical and horizontal continuity, and contain significant widths of near-surface "bulk tonnage" mineralization (such as 4.3 g/t gold over 45.5 m at a 60-m depth) and higher-grade gold mineralization (up to 28.47 g/t gold over 11.70 m) that is potentially amenable to underground mining (www.wolfdenresources.com).

Placer Dome (CLA) Ltd. and 50% joint-venture partner Wolfden Resources Inc. completed a 28-hole program of in-fill drilling on 25-m centres on their East Bay project, 12 km north of the Campbell mine. An inferred resource of 1.4 Mt grading 8.0 g/t gold in five lenses was estimated from past drilling. The current drill program was designed to upgrade the established resource. During the year, Placer Dome also drilled Wolfden's Marathon-McNeely property from the Campbell mine's 39th level (www.placerdome.com).

Rubicon Minerals Corporation completed drill programs on a number of properties in the Red Lake belt, including the Adams Lake, Sidace, East Bay and Black Bear Lake properties. The most significant results were obtained from a 10 085-m program targeting the Phoenix zone on the McFinley project, 10 km north of Red Lake. The Phoenix zone is now known to extend 500 m along strike and to a depth of more that 200 m. Gold mineralization of up to 15.8 g/t gold over 3.5 m is associated with an altered mafic volcanic stratigraphy hosting a complex, 20-m to 30-m-thick carbonate replacement zone with numerous colloform banded carbonate veins up to 5 m thick (www.rubiconminerals.com).

Southern Star Resources Inc. and Exall Resources Ltd. continued drilling their Gold Eagle joint-venture property in central Red Lake. Initial efforts focused on expanding the inferred resource (309 000 t grading 13.15 g/t gold) of the Western Discovery zone, situated in the McKenzie Island stock. Drilling of favourable altered volcanics of the Bruce Channel zone intersected up to 28.47 g/t gold over 11.70 m at a downhole depth of 1240 m. Drilling with two rigs on this target continued to year-end (www.southernstar.com and www.exall.com).

Gold Canyon Resources Inc. completed approximately 34 000 feet of drilling and confirmed significant gold mineralization in three major target areas of its Springpole gold project, situated in the Birch Lake greenstone belt. The East Extension zone hosts a shallow raking chute of bonanza-style gold mineralization in which the length-weighted average of all holes drilled across the structure is 1.148 oz/ton gold over an average intercept length of 8.8 feet. Drilling will continue early in 2006 (www.gcu-vse.com).

The Black Fox property, near Matheson, has become the cornerstone project for Apollo Gold Corp. To date, the company has completed over 200 000 m of diamond drilling. In 2003, proven and probable mineral reserves for the proposed open-pit portion of the Black Fox property were 2 953 000 t grading 4.81 g/t gold. A new figure will be released in early 2006 (www.apollogold.com).

Goldeye Explorations Limited intersected 1.5 m grading 444.8 g/t gold in diamond drillhole G-05-22 on the Big Dome zone in Tyrrell Township near Gowganda. In addition, a new zone was discovered in the same hole grading 0.27 g/t gold over 33.8 m (www.pathcom.com/~goldeye/).

In 2001, Kirkland Lake Gold Inc. acquired the Macassa mill, mine and four adjacent former gold producers in Kirkland Lake. Since then, it has improved reserves to 927 000 oz of gold and discovered four previously unidentified north-trending gold zones. A recent drillhole and a wedged hole intersected 2.3 oz/ton gold over 90.4 feet and 1.43 oz/ton gold over 124.5 feet, respectively (www.klgold.com).

Queenston Mining Inc. carried out exploration projects totaling approximately $3.0 million in the Kirkland Lake area. The best results to date were obtained at the Upper Beaver property where a new zone assaying 12.5 g/t gold with 1.1% copper over a core length of 23.6 m was intersected. A second-phase, 12-hole (7000 m) diamond-drilling program was initiated (www.queenston.ca).

St. Andrew Goldfields Ltd. is pressing ahead with permitting, engineering and planning for the development of the Taylor mine project. An advanced exploration program commenced during the fourth quarter of 2005 (www.standrewgoldfields.com).

Landore Resources Canada Inc. drilled 3921 m on its Miminiska Lake gold property near Fort Hope. The drill program tested an iron formation that had previously returned 9.8 g/t gold over 3.5 m and 6.0 g/t gold over 3.5 m. The best intersections included 8.7 g/t gold over 0.6 m, 6.6 g/t gold over 1.5 m, 9.7 g/t gold over 1.1 m, and 6.0 g/t gold over 2.0 m. Landore plans to conduct a detailed review of all Miminiska drillhole data and continue with exploration of the eastern Uchi Subprovince in the vicinity of the property (www.landore.com).

Alto Ventures Ltd. completed geological mapping, prospecting and induced polarization (IP) geophysical surveying on its Mud Lake gold project near Beardmore. The program has identified nine main gold showings returning between 4.08 and 50.61 g/t gold along a 6-km, northeast-trending corridor in sheared granodiorite. The company believes the targets identified are primed for diamond drill testing (www.altoventures.com).

Kodiak Exploration Limited completed two years of geological, geochemical and geophysical surveys and diamond drilling on its Knucklethumb gold/base-metal project near Nakina. The Vent gold zone, 210 m long and up to 15 m wide, has yielded channel cuts grading up to 11.88 g/t gold and 25 g/t silver over 1.0 m. A planned 1500-m drilling program will target a Titan 24 deep IP chargeability zone (www.kodiakexp.com).

Roxmark Mines Limited upgraded and commissioned its Northern Empire mill in Beardmore where it processed several hundred tonnes of gold ore from the East Leitch property (producing 125 oz of gold) and also completed 1865 m of drilling at the Nortoba-Tyson molybdenum property. In addition, the mill was readied for the planned processing of molybdenum ore. The operating permits are now expected to be received early in 2006 (www.roxmark.com).

An indicated resource of 424 000 t at 13.4 g/t gold and an inferred resource of 387 000 t at 10.7 g/t gold has been determined by a scoping study on the Duport project for Halo Resources Ltd. Twenty-three holes totaling 7090 m were completed in 2005. Twenty significant gold intersections from the drill program returned an average intercept of 13 g/t gold over 1.4 m. Additional drilling is planned to test airborne magnetic anomalies and electromagnetic conductors identified from a 50-m line-spacing 2750-km survey (www.haloresources.com).

Rainy River Resources Ltd. completed the acquisition of the Rainy River property in 2005. Selected drillholes from past exploration programs are being re-logged and sampled. One hundred and four reverse circulation holes and 17 diamond drillholes were completed in 2005 focusing on the #17 Gold zone. Significant intersections from drillhole NR05-05 on the zone are 2.21g/t gold over

69.95 m, and 5.34 g/t gold over 13.5 m. A diamond-drill program is planned to test the down-plunge extension of the high-grade areas of the #17 zone (www.rainyriverresources.com).

Opawica Explorations Inc. completed an 11-hole, 1700-m diamond-drill program on the Atikwa Lake gold-copper property. Significant intersections from drillhole OPW-6 are 5.0 g/t gold and 2.64% copper over 9.85 m, and 10 m grading 2.8 g/t gold and 5.4% copper. Additional drilling is planned for 2006 (www.opawica.com).

Spruce Ridge Resources Ltd. completed a preliminary program of stripping and channel sampling on its Nora Lake gold property near Beardmore. A mineralized zone has been exposed over a length of 240 m and a width of 24 m. Seventeen channel samples returned 8.42 g/t gold over 3.35 m, 6.69 g/t gold over 1.22 m, 6.14 g/t gold over 0.61 m, and 1.14 g/t gold over 8.53 m. The main stripped area exposed mineralized rock over a length of 120 m and a width of at least 24 m. The company plans a preliminary program of diamond drilling to test the full width of the mineralized zone.

Houston Lake Mining Inc. announced a preliminary inferred mineral resource of 106 400 t at 2.97 g/t gold from the Angel Hill gold zone. Results from 235 percussion drill samples returned a significant intercept of 479 g/t gold over 1.22 m. A bulk sampling program and additional diamond drilling are planned for 2006 (www.houstonlakemining.com).

Prospectors E. Neczkar and D. Baird continued exploration of the Dingman gold deposit in Marmora Township, orignally explored by Noranda Exploration Co. Ltd. in 1986. Noranda completed diamond drilling totaling 21 326 feet and metallurgical testing. Deloro Minerals Inc., the most recent owner, reported a geological resource of 4 million tons grading 0.048oz/ton gold.

Prospectors R. Dillman and J. Chard continued the evaluation of previously known zones of gold mineralization and new showings discovered in 2004 on their properties in Grimsthorpe and Tudor townships. The claims encompass three historic past-producing gold deposits and a section of the Moira River fault.

Base Metals

Cascadia International Resources Inc. will conduct a 43-101-compliant Resource Report for the Norton Lake copper-nickel project, northeast of Fort Hope. Cascadia has earned a 51% working interest from East West Resource Corporation and Canadian Golden Dragon Resources Ltd. by spending $1.5 million on the project. Recent exploration has extended the existing zone from the 100-m elevation to the 400-m elevation with grades improving with depth. The zone remains open at depth and to the east with another upper zone recently discovered. Follow-up programs will be designed to determine whether additional lenses exist (www.cascadiaintl.com).

Drillhole M6 intersected a 7.9-m section of massive sulphides that returned 3.1% copper on Probe Mines Limited's McFaulds Lake area property. A second drillhole intersected the same zone returning 2.4% copper over 6 m, including 3.4% copper over 2.5 m. Anomalous zinc and precious-metal values also were returned. The discovery represents an important new volcanic massive sulphide (VMS) horizon in the area (www.probemines.com).

A shallow drilling program on Eloro Resources Ltd.'s Hurdman Township property returned an intersection of 1.17% zinc and 11.26 g/t silver over 23.75 m, including 8.69% zinc and 12.30 g/t silver over 0.50 m and 2.02% zinc and 12.12 g/t silver over 23.60 m, including 3.96% zinc and 7.55 g/t silver over 5.6 m (www.elororesources.com).

East West Resource Corporation and associated companies (Canadian Golden Dragon Resources Ltd., Mega Uranium Ltd., and Canplats Resources Corporation) have a significant land position in the Thunder Bay area with claims in the Shebandowan and Nipigon Plate areas. These companies, under the direction of Robert Middleton, P.Eng., have been aggressively exploring for a variety of

commodities in these areas. Targets include VMS base metals, copper-nickel-platinum group elements (PGE) in layered mafic to ultramafic complexes, uranium and iron oxide-copper-gold (IOCG), and porphyry and lode gold deposits. The central focus in 2005 within the Thunder Bay South District has been the western Shebandowan belt (Hamlin, Deaty, Tilley and Vanguard townships), the Black Sturgeon area of the Nipigon Plate (Seagull/Disraeli), and various uranium properties (Greenwich Lake and others) (www.eastwestres.com).

Marathon PGMs Corporation continues to diamond drill its Marathon property. The 2005 drilling program consisted of 102 holes totaling 14 000 m. This drilling was able to extend the mineralization in the Main zone as well as in the Malachite, BR and RD zones. Drill results included hole M-05-58, which intersected 10 m of 8.84 g/t PGMs and 0.12% copper (www.marathonpgm.com).

First Nickel Inc. completed more than 29 000 m of drilling on its Dundonald property. Significant assays include 3.30% nickel and 1.27 g/t platinum plus palladium plus gold over 1.35 m, 11.19% nickel over 3.0 m, 5.22% nickel and 1.25 g/t platinum plus palladium plus gold over 2.1 m, and 25.6% nickel over 0.8 m (www.firstnickel.com).

At its Highbank Lake property located in the James Bay Lowlands, Northern Shield Resources Inc. made a recent discovery of four chromitite boulders that returned anomalous PGE and nickel values. One boulder returned 1.072 g/t gold plus platinum plus palladium, 0.192% nickel and 27.7% chromium (www.northern~shield.com).

Inspiration Mining Corporation completed over 3000 m of diamond drilling on the North zone of its Langmuir property. The drilling consistently encountered three distinct zones of high-grade nickel mineralization surrounded by lower-grade nickel mineralization haloes. Significant assays include 0.862% nickel over 16.4 m and 2.38% nickel over 3.28 m (www.inspirationmining.com).

At its Adams nickel property, Mustang Minerals Corp. discovered a new nickel zone that returned values of 0.63% nickel from a 3.34-m-thick section that included a 0.52-m section that yielded 1.05% nickel. The nickel-bearing conductor has a strike length of approximately 250 m and is hosted in a favourable komatiite-rich sequence (www.mustangminerals.com).

Blackstone Ventures Inc. acquired and completed two phases of drilling on the Kenbridge property. Airborne and ground geophysical programs were also completed. Drill core samples of intrusive breccia and gabbro returned 1.81% nickel and 0.59% copper over 5.9 m (www.blv.ca).

MetalCORP Ltd. continued with its mineral exploration program at the Big Lake property, located approximately 20 km southeast of Marathon, Ontario. The program for 2005 included continued diamond drilling, detailed geological mapping, and a detailed airborne geophysical survey. This work has resulted in defining additional targets for copper-nickel-PGMs exploration. Drilling on the A2 copper-nickel zone was able to trace the zone on strike and to a depth of 20 m. Drill results indicate 1.7% nickel and 1.4% copper over narrow intercepts. Drilling on the J4 and J5 zones have traced these for a 1500-m strike length and to 200 m in depth. Drill results indicated 0.9 g/t platinum, 1.0 g/t palladium, 0.2% copper and 0.2 % nickel over 1.5 m (www.metalcorp.ca).

First Nickel Inc. acquired the past-producing Lockerby mine from Falconbridge Limited in June 2005. The mine was closed by Falconbridge Limited in late 2004. Mining resumed in 2005 with the intention of ramping up production to historical production levels of over 220 000 t/y. Agreements were also reached with Inco Limited to develop and mine extensions of the Lockerby Depth deposit on Inco Limited property (www.firstnickel.com).

FNX Mining Company Incorporated is studying the feasibility of re-opening the Levack mine. Shaft sinking continued at the Podolsky property to bulk sample the 2000 Deposit, with possible production by 2007. The majority of the FNX exploration budget has been allocated to explore copper-platinum-palladium-gold footwall deposits in the Levack-McCreedy West mine complex and

similar deposits at the Podolsky property. The company recently acquired the Sudbury area properties of Aurora Platinum Corporation (www.fnxmining.com).

Inco Limited continues exploration at all of Inco's underground operations in the Sudbury area. In the east range of the Sudbury Igneous Complex, exploration at the Victor project consisted of testing footwall mineralization above 6500 feet. Exploration at the Totten mine on the Worthington offset identified a potential ore-bearing structure along strike of the dike to the south. North Range exploration consisted of testing gaps of diamond drilling in Norman Township. Inco Limited entered into an agreement with Lonmin Canada Incorporated to establish a 50:50 unincorporated joint venture on the following Inco properties: McKim (Frood and Little Stobie mines), Denison (Crean Hill and Vermilion mines), Levack North, Capre, Trillabelle, and Wisner (www.inco.com).

Falconbridge Limited continues to conduct extensive exploration at its three remaining mines in the Sudbury area. Shaft sinking commenced at the Nickel Rim South project in the Sudbury area where production is expected by 2009 (www.falconbridge.com).

Wallbridge Mining Company Limited continued exploration of its Sudbury holdings. Diamond drilling continued at the Broken Hammer zone where new intersections of high-grade platinum plus palladium plus gold were encountered. The total inferred resources are estimated to contain 251 000 t at a grade of 3.80 g/t platinum plus palladium plus gold, 1.00% copper, and 0.10% nickel. At the newly discovered Trill Offset dike in Totten Township, massive sulphide zones were discovered in the dike by trenching and stripping. Field mapping and ground geophysical surveys discovered a strike length of approximately 1.6 km of the Trill Offset. Work was also ongoing at the Windy Lake, Frost Lake, and Wisner properties (www.wallbridgemining.com).

United Reef Limited conducted diamond drilling at the formerly producing Nickel Offsets mine on the Foy Offset dike in Foy Township. The property hosts the past-producing Nickel Offsets mine, which produced 208 000 t of nickel-copper ore between 1943 and 1957 through two shafts with reported recoveries of 4.56 million lb of nickel and 3.32 million lb of copper. The initial exploration program was to test the property above the 500-m level. The company also acquired an additional 15 claim units covering a 2.6-km strike length of the projected down-dip extension of the Foy Offset dike to a depth of 2000 m (www.unitedreef.com).

Pacific Comox Resources Ltd. reported assays from a five-hole diamond-drilling program near the Ryan Lake copper-molybdenum property near Matachewan. The best intersection is 61.1 feet grading 0.56% copper, 0.052% (1.15 lb/t) molybdenum, 0.11 g/t gold and 4.60 g/t silver (www.pacificcomox.com).

Pacific North West Capital Corporation continued exploration diamond drilling on its River Valley PGE property in Dana Township, east of Sudbury. At the Lismer's Ridge Extension, one diamond drillhole intersected 34 m grading 1.68 g/t platinum plus palladium plus gold, including 5.69 g/t platinum plus palladium plus gold over 3 m. Several more high-grade zones were intersected and results to date have defined a mineralized zone approximately 30 m wide to a depth of 200 m. Diamond drilling was also conducted at the Varley, Casson, Azen North, Azen South, Drop, and Jackson Flats zones.

Pacific North West Capital Corporation and Anglo American Platinum Corporation Limited also agreed to a "Phase 8" part of the project for $1.5 million. A portion of this budget will be allocated for geological modelling and a 40-t bulk sample will be shipped to Anglo American Platinum Corporation Limited's facilities in Johannesburg for metallurgical testing. Anglo American Platinum Corporation Limited has committed over $18 million to date on the River Valley properties (www.pfncapital.com).

Freewest Resources Canada Inc. is continuing exploration of its Wye Lake VMS discovery on the Sungold property in the western Shebandowan belt. The discovery is situated between Wye Lake

and Redfox Lake approximately 120 km west of Thunder Bay. Drill intercepts of 6.21% zinc over 4.43 m (WL05-02), 1.22% copper over 5.78 m (WL05-07), 5.09% zinc over 2.15 m (WL05-08), 1.74% copper over 3.00 m (WL05-13), and 2.16% copper and 6.91% zinc over 0.43 m (WL05-15) were reported from work on the property (www.freewest.com).

Ursa Major Incorporated signed an option agreement with North American Palladium Ltd. whereby the company can earn a 60% undivided interest in the Shakespear project located 70 km west of Sudbury. Diluted probable reserves stand at 7.3 Mt grading 0.37% nickel, 0.39% copper and approximately 1 g/t total platinum metals (TPM). A total of 19 diamond drillholes were completed during the year and a full feasibility program is currently in progress. Three scenarios to mine and mill the deposit are under consideration (www.ursamajorminerals.com).

Nikos Explorations Ltd. carried out two diamond-drilling programs at its Coppercorp property in Ryan Township northwest of Sault Ste Marie. Drilling targeted a combination of geological, induced-polarization and mobile-metal-ion-geochemical anomalies along the western flank of a 5-km-long magnetic lineament. The most significant drillhole result showed 1.62% copper and 5.3 g/t silver over a true width of 17.8 m that included 9.49% copper over 1.85 m (www.nikosexplorations.com).

Other Commodities

El Nino Ventures Inc. is exploring eight uranium properties in the Bancroft area. Detailed exploration of the two properties with the largest reported reserves was successful in confirming the historically established grades. Total production from the camp was an estimated 10.6 million tons of ore mined to produce 14.8 million lb of U_3O_8.

Rampart Ventures Ltd. drilled 22 holes to test the Split Rapids uranium occurrences on its Black Sturgeon property, south of Lake Nipigon. Significant assay results included 2.99% U_3O_8 over 1.5 m, 1.99% U_3O_8 over 0.30 m, 0.56% U_3O_8 over 0.30 m, 0.54% over 0.30 m, and 0.12% U_3O_8 over 3.52 m. The thrust of the next diamond drill program will be to follow this uranium-bearing trend westwards under Sibley Group sedimentary rocks where any unconformity-type uranium mineralization will be preserved in its entirety (www.rampartventures.com).

Randsburg International Gold Corporation completed approximately 930 m of diamond drilling at its Titan iron-titanium-vanadium project in Angus and Flett townships, approximately 50 km north of North Bay. Assays from recent diamond drilling are forthcoming (www.randsburgdiamonds.com).

Gleeson Rampton Explorations completed a small bulk sample from the company's muscovite prospect in Lavant Township. Testing by SGS Lakefield indicated that flotation and magnetic separation yielded a 96% pure muscovite product with a 76% overall recovery. SGS concluded that the muscovite ore has good potential for making a saleable product.

Ontario Geological Survey

The Ontario Geological Survey (OGS) delivers the geoscience and information services program at the Ministry of Northern Development and Mines. In response to client needs for accurate, up-to-date and accessible geoscience data in a form that can be easily searched and easily integrated into other software applications, the OGS, working with the Business Solutions Section, is deploying Geology Ontario, which provides web access to the province's geoscience data and products. The OGS continues to market Ontario's mineral potential to attract new mineral investment and enhance Ontario's competitiveness and technical services available through the Geoscience Laboratories and GEO Enterprises.

The OGS continued to work in collaboration and in partnerships on technical (e.g., Lake Nipigon Region Geoscience Initiative, Discover Abitibi, and several conservation authorities) and

communication (e.g., Eabametoong First Nation, Neskantaga First Nation, Kasabonika Lake First Nation, and Webequie First Nation) projects. The OGS anticipates new partnerships with Natural Resources Canada's Geological Survey of Canada (GSC) as part of the Targeted Geoscience Initiative 3 and under Cooperative Geological Mapping Strategies Across Canada (should that federal program be realized).

The OGS has a pan-provincial mandate, but Ontario's Far North represents one of its last geological frontiers. In spring 2005, the Government of Ontario announced the Far North Geological Mapping Initiative as a cornerstone of the Ministry of Northern Development and Mines' "Northern Prosperity Plan." A range of mapping projects and the purchase of proprietary airborne geophysical data will be initiated during the 2005/06 fiscal year. Because the Far North is the home of about 40 remote First Nation communities, a component of the Far North Geological Mapping Initiative includes communication, relationship-building, and partnerships with several Aboriginal communities and business organizations to help raise their understanding of geoscience, the mineral industry, and prospecting. These activities help lay a foundation for northern geoscience and mineral exploration, and help the Aboriginal communities assess options available to support or directly participate in the mineral industry.

2.7 MANITOBA[13]

Overview

Exploration and Development

Near-record-high prices for base metals, sustained strength in precious-metal prices, and renewed interest in diamond exploration in Manitoba's Far North are expected to push exploration spending in the province to about $53 million for 2005. This represents a 47% increase in spending from the $36 million spent in 2004.

The total area of mining claims and mineral exploration licences as of November 1, 2005, was 5 531 781 ha, compared to 3 298 445 ha in 2004. The total area of mineral dispositions and leases in good standing as of November 1, 2005, was 5 681 554 ha, compared to 3 492 971 ha at the end of 2004. Surface exploration diamond drilling in 2005 was 85 000 m, up from 61 766 m in 2004.

In 2002, Manitoba amended *The Mines and Minerals Act* to change the confidentiality period for assessment reports. As a result, approximately 3000 previously unavailable reports were released to the public domain on November 1, 2005. The new confidentiality period for most reports is a maximum of three years; airborne geophysical surveys have a minimum confidentiality period of five years.

BASE METALS

Inco Limited announced in August 2005 that it will spend $45 million to develop the 1-D Lower orebody in Thompson. The orebody is located between the 3600- and 4160-ft levels at the north end of the Thompson mine. Development will commence in 2006 and first production is scheduled for 2008. The new mine development will also provide access to previously drilled targets that will be reassessed using more advanced technology.

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[13] The Manitoba review of activities was prepared by the Mineral Resources Division of Manitoba Industry, Economic Development and Mines. For more information, the reader is invited to contact Ric Syme, Director, Manitoba Geological Survey, by telephone at (204) 945-6556 or by e-mail at rsyme@gov.mb.ca.

Inco also doubled capital spending at its Manitoba operations in 2005 to roughly US$80 million. Planned work includes rebuilding the main smelter furnace. The Thompson smelter will be processing concentrate from Voisey's Bay beginning in early 2006.

Inco continues to search for new sources of ore in the prolific Thompson Nickel Belt. In 2005, Inco will have spent approximately $6.5 million for in-mine and surface exploration seeking materials to feed its fully integrated nickel mining and producing operation at Thompson. In addition to these exploration activities, Inco has entered into partnerships with junior explorers, including Canadian Royalties Inc., who has conducted geophysics and drilling on its Thompson Nickel Belt South project. The project covers 70 km of favourable stratigraphy from Halfway Lake south to near Ponton. The five-year agreement that commenced in 2003 requires Canadian Royalties to spend $5 million on exploration.

Also in 2005, Inco and partner Nuinsco Resources Limited completed overburden drilling and diamond drilling at the Mel project that is located 25 km north of Thompson. The multi-year agreement that commenced in 1999 requires Nuinsco Resources to spend $6 million on exploration.

Crowflight Minerals Inc. conducted an extensive winter drill campaign in the Thompson and Wabowden area on its large portfolio of properties under option from Falconbridge Limited. At the Bucko deposit in Wabowden, a National Instrument (NI) 43-101-compliant resource calculation concluded the former nickel producer contains an indicated resource of 1.22 Mt of 2.71% nickel. A feasibility study was expected to be completed in the fall. Crowflight commenced a surface in-fill drill program in July, hoping to expand Bucko's indicated resource base by 300 000 t. Results included a 56.0-m intersection of 2.01% nickel.

Crowflight also conducted winter drilling to outline near-surface massive sulphides with higher-grade nickel values within the large low-grade Bowden Lake deposit (82 Mt of 0.62% nickel) at Wabowden.

Nuinsco Resources commenced a scoping study to evaluate the potential for open-pit and underground mining of the Minago deposit, located 140 km south of Thompson. A recent study concluded that Minago contains a measured and indicated resource of 29.84 Mt of 0.64% nickel. Winter drilling on the Main zone at Minago returned a 245.9-m interval of 0.68% nickel with shorter intervals of higher-grade mineralization.

Callinan Mines Limited conducted geophysics and drilling at its Phillips Lake and Pine properties near Wabowden. Drilling intersected thick intervals of low-grade nickel-copper sulphides that contained some shorter intervals of higher-grade material. Drilling at the Pine property returned a 0.7-m interval of 2.04% nickel and 0.11% copper.

Seymour Exploration Corp. is conducting exploration on mineral leases held by Lynn Lake Nickel Mining Company Limited. The past-producing Lynn Lake mine closed in 1976 after 23 years of production. According to Seymour Exploration, historical records indicate that a substantial nickel resource remains in-situ. A resource calculation completed by Wardrop Engineering Inc. concluded that the property contains a measured and indicated resource of 5.8 Mt of 0.85% nickel and 0.39% copper. The study also identified 15 high-priority targets adjacent to and within the mine workings that remain completely untested. Seymour Exploration is planning to conduct a drill program to test the new targets.

North American Palladium Ltd. entered into an option agreement to explore five properties held by Rare Earth Metals Corp. near Lynn Lake. The properties cover five separate mafic-ultramafic bodies that have similarities to the two intrusives that hosted the Lynn Lake nickel deposits.

Canstar Resources Inc. conducted geophysics and drilling in the Seal River area west of Churchill. The company entered into an option agreement with holder BHP Billiton Diamonds Inc. in 2004 to

explore a number of airborne anomalies for base metals and potential kimberlites. Canstar Resources claims that no economic values of base metals or kimberlite were intersected during the seven-hole program.

BHP Billiton Diamonds and partners ValGold Resources Ltd., Cream Minerals Ltd. and Sultan Minerals Inc. commenced a six-hole drill program in mid-March at their Stephens Lake property east of Gillam. The program had to be suspended prematurely due to spring break-up. The companies plan to resume the drill program in early 2006. The Stephens Lake property is extensively covered by glacial till and Paleozoic sedimentary rocks that overlie Precambrian lithologies believed to represent the extension of the Thompson Nickel Belt.

In the Flin Flon-Snow Lake area, Hudbay Minerals Inc. (formerly OntZinc Corporation) acquired Hudson Bay Mining and Smelting from Anglo American plc in late 2004. In February 2005, Hudbay announced that it would spend $10 million on exploration over 12 months on its large Manitoba- and Saskatchewan-based property portfolio. Hudbay is focusing its exploration strategy on drilling SPECTREM geophysical anomalies, structural fold repeats, and targets around existing and former producing mines.

Mustang Minerals Corp. acquired a 100% interest in the Mayville property in the Bird River Belt in southeastern Manitoba. Drilling commenced in June to test conductors associated with the 12-km-long, layered mafic-ultramafic Mayville intrusion. By early August, 16 holes had been completed on the M2 zone, all intersecting wide intervals (minimum 20-m true thickness) of sulphide mineralization containing low-grade nickel-copper-PGE values. Within the large mineralized envelope are shorter intervals of higher-grade material. Drillhole May-02, for example, contained 33.6 m of 1.06% copper and 0.50% nickel within a 61-m interval of slightly lower-grade sulphides. Other geophysical targets remain to be tested and the M2 zone conductor has 1.2 km of untested strike potential.

Mustang Minerals also owns a 100% interest in the Maskwa nickel deposit, 30 km south of the Mayville property. A NI 43-101-compliant resource calculation completed in February 2005 estimates that Maskwa contains an indicated open-pit and underground resource of 6.0 Mt of 0.74% nickel and 0.15% copper. Drilling conducted in the spring was successful in extending the Maskwa deposit to the east where it remains open. Mustang is conducting metallurgical work and commencing development of the project.

Lac des Iles Mines Ltd., a wholly owned subsidiary of North American Palladium, entered into an option agreement with Gossan Resources Limited to earn a 50% interest in Gossan Resources' Bird River property in southeastern Manitoba. The property covers 21 km of the Bird River Sill, which contains concentrations of PGE, nickel, copper, zinc and chromite. Lac des Iles Mines completed an airborne VTEM survey and an eight-hole summer drill program. Four of the eight holes encountered sulphide mineralization; the most notable intersection returned 1.08% nickel and 0.50% copper over 13.75 m.

PRECIOUS METALS

Bema Gold Corporation and Wolfden Resources Inc. completed 70 holes during winter and summer/fall drilling at their Monument Bay property in northeastern Manitoba. Drilling at the Twin Lakes and Seeber River zones returned some high-grade gold values, including 4.8 m of 31.71 g/t gold and 3.28 m of 41.95 g/t gold. Inferred resources at Monument Bay currently stand at 1.07 Mt grading 15.36 g/t gold using an 8 g/t cut-off. This resource calculation does not include results from the 2005 winter drill program.

Canadian Gold Hunter Corp. conducted a seven-hole drill program on the Hunt zone at depth at its Assean Lake property northeast of Thompson. Three long holes that were drilled to find extensions of the Hunt zone beneath a displacing fault were unsuccessful. The other holes tested the western

extension of the Hunt zone and returned mostly low-grade gold values over short intervals. Rare Earth Metals has a 40% joint-venture interest in the project.

Rare Earth Metals conducted a short two-hole drill program at its Row/Lass and Wood claims, which cover the east and west strike directions of Canadian Gold Hunter's Assean Lake property. Drilling tested separate gold and nickel-copper induced polarization and geochemical anomalies. Neither drillhole returned economic values.

Claude Resources Inc. and partner Pioneer Metals Corporation completed a 17-hole drill program at its Nokomis Lake gold property near Sherridon. The focus of the drill program was to verify the location and continuity of the host horizon and locate new, near-surface gold zones along strike. Every hole encountered the host horizon, but returned low-grade gold values over 1 m to 2 m. The Nokomis gold zone hosts a historic mineral resource estimate of 349 000 t grading 6.10 g/t gold. Claude was also conducting work at the former producing Tartan Lake gold mine near Flin Flon.

Black Pearl Minerals Consolidated Inc. completed a 3000-m drill program at the Gold Dust and McCafferty zones on the east side of Wekusko Lake near Snow Lake. The drill program consisted of 71 shallow holes along strike from the two zones to define high-grade gold shoots. At Gold Dust, two new high-grade shoots were discovered, returning values up to 17.4 g/t gold over 4.5 m. At the McCafferty zone, a new high-grade shoot was discovered, returning 63.74 g/t gold over 1.45 m.

Foran Mining Corporation conducted a spring drill program at its North Star property west of Snow Lake. The program was designed to increase the tonnage of the North Star vein system below the 230-m level. Foran retained Roscoe Postle Associates to prepare an updated mineral resource estimate for the North Star property. The study reported a very limited indicated resource of just over 19 000 t grading 10.6 g/t gold (about 6500 oz of contained gold) and concluded the resource was insufficient to support a commercial operation.

Falcon Ventures Incorporated completed a five-hole drill program at its Butterfly Lake property northeast of Norway House in central Manitoba. The company says all drillholes intersected alteration zones mineralized with pyrite, pyrrhotite and arsenopyrite. The best hole intersected 0.35 m of 6.6 g/t gold.

Alto Ventures Ltd. acquired a 5516-ha exploration licence surrounding its Oxford Lake claims. The Oxford Lake property contains the Rusty gold zone, which received extensive work by Noranda in the late 1980s. An historical resource estimate based on wide-spaced drilling concluded the Rusty zone contains 800 000 t grading 6 g/t gold. Alto intends to seek a joint-venture partner to further explore the large prospective gold property.

Gossan Resources conducted a summer mapping and geochemical sampling program at its Sharpe Lake property. The project consists of three exploration licences covering 40 km of strike length located immediately to the west of the Bema-Wolfden Monument Bay gold property. Geological mapping conducted by the Manitoba Geological Survey (MGS) in 2003 confirmed that the major deformation zone at Monument Bay, the Stull Lake-Wunnummin fault zone, also transects the Sharpe Lake area. Gossan has so far identified two gold occurrences that were to be investigated during the summer work program.

In southeastern Manitoba, San Gold Resources and Gold City Industries completed their amalgamation process, forming the new company San Gold Corporation. San Gold owns the Bissett gold operation (purchased from Harmony Gold Canada), which consists of an 1100-t/d mine and mill with proven and probable reserves of 818 000 t grading 9.2 g/t gold. San Gold said that the mill would be ready to process the first development ore in December 2005. The company also has three other near-surface gold deposits located near the Bissett operation that can supply additional feed to the mill. The San Gold #1 deposit is the most advanced with a NI 43-101-compliant indicated resource of 256 870 t of 7.5 g/t gold. An access decline is advancing towards the orebody and ore

development on the first level (200 ft) was to begin by December. San Gold #1 will contribute half of the mill feed to the base operating plan of approximately 700 t/d. Recent deep drilling at the San Gold # 3 zone returned a high-grade intersection of 6.0 m grading 18 g/t gold. As well, the company says that drilling over 1.1 km of strike on the San Gold #2 and #3 zones indicates a possible continuous gold mineralized horizon open in both directions along strike and at depth.

Wildcat Exploration Ltd. completed winter drill programs at its Poundmaker and Siderock properties near Bissett. Drilling near the Poundmaker shaft intersected near-surface mineralization grading 41.5 g/t gold over 0.6 m. Drilling at the recently discovered Portage gold zone at the Siderock property intersected multiple intervals of anomalous, up to 3 g/t, gold over short to moderate widths. A summer sampling program conducted at the Poundmaker property based on a re-evaluation of historical data identified an auriferous shear zone with at least two gold showings. Wildcat Exploration says random grab samples from the showings returned gold values up to 16.9 g/t gold.

An initial mapping program conducted at Wildcat Exploration's Garner Lake property returned high-grade gold assays from surface sampling. The program identified two gold occurrences within strongly altered and sheared volcanics located near the Beresford Lake shear zone. The prospective alteration zones were identified by MGS mapping in 2002. Grab samples from an old trench at the first occurrence returned up to 153.2 g/t gold. Assays from samples taken at the second occurrence yielded highly anomalous arsenic (up to 0.9%) and up to 3.8 g/t gold. Wildcat Exploration says the area has received very limited diamond drilling and the results merit significant follow-up work.

At Snow Lake, mining and milling operations at the New Britannia mine were suspended in September 2004. In January 2005, joint-venture partners Kinross Gold Corp. (50%) and High River Gold Mines Ltd. (50%) placed the operation on care and maintenance after exploration efforts failed to find the required resource to continue mining. Production at New Britannia began in 1995 and surpassed the mine's eight-year life expectancy.

DIAMONDS

The search for diamonds in Manitoba heated up again in late 2004 as interest shifted to the Hudson Bay Lowland and Seal River areas west of Churchill. De Beers Canada Inc. secured a 20 000-km^2 land package at Seal River based on positive sediment samples obtained in earlier surveys. About 40% of the property was covered by an airborne magnetic survey; the balance will be completed in 2006 and drilling of high-priority targets will follow.

The De Beers acquisition surrounds claims containing diamond and base-metal targets outlined by BHP Billiton Diamonds who optioned the property to Canstar Resources for further investigations. Western Warrior Resources Inc. has conducted several geophysical surveys and ground follow-up work has outlined 35 kimberlite targets at its Eppler Lake property near Seal River. The company is planning a drill program in early 2006 to test the high-ranking kimberlite anomalies, as well as base- and precious-metal targets.

In the Hudson Bay Lowland, juniors Falcon Ventures, Diamonds North Resources Ltd., Foran Mining, and Indicator Explorations Ltd. acquired exploration licences to search for diamonds. Diamonds North Resources and Stornoway Diamonds Corp. entered into a 50:50 joint-venture agreement to explore Diamonds North's Manitoba Highlands project. With Diamonds North as operator, work plans for 2005 included ground geophysics to outline targets for future drilling.

URANIUM

The recent surge in uranium prices has renewed exploration interest in the northwest corner of Manitoba. The area received considerable exploration for uranium in the 1960s and 1970s. CanAlaska Ventures Ltd. conducted prospecting and a detailed lake sediment-sampling survey on its North East Athabasca project. The project consists of exploration licences that straddle the

Manitoba-Saskatchewan border in the Far North of both provinces and covers the northern extension of the Wollaston Belt. The focus of the project is shear-hosted deposits and other basement-hosted unconformity-type deposits in an area where many uranium showings were found in the late 1970s. On the Snyder project area, early results from grab sample analyses of mineralized boulders and outcrop returned 0.24% to 1.54% U_3O_8. CanAlaska Ventures is still waiting for results of the extensive lake sediment-sampling program.

Santoy Resources Ltd. acquired a 100 000-ha permit adjoining CanAlaska Ventures' permit to the northeast. Santoy Resources intends to identify the source of boulders mineralized with uranium, molybdenum, base metals and precious metals located by previous explorers.

SPECIALTY/INDUSTRIAL MINERALS

Agrium Inc., a leading global producer of agricultural nutrients, acquired a five-year, 45 000-ha exploration permit to explore for potash in the St. Lazare area. The company will conduct preliminary seismic work to determine if there are sufficient potash reserves in the area to warrant further potash exploration in the region. If exploration results are successful, Agrium has the option to convert the exploration permit to a potash mineral lease within the five-year term to facilitate mining.

Sunterra Horticulture (Canada) Inc. is in its fourth year of sphagnum peat production from a bog located 10 km south of the Lake Winnipeg Narrows on the west shore. Berger Group continued to develop a sphagnum peat bog 20 km south of Hadashville in southeastern Manitoba. Premiere Horticulture had a fire at its Giroux plant in 2005, but it is anticipated that the plant will be rebuilt.

Gossan Resources acquired two adjacent leases at its Semourville silica sand property on the east shore of the south basin of Lake Winnipeg, increasing its property size to 274 ha. A composite of 19 silica sand samples from a drilling program carried out in 2004 returned a silica content of 94.2% without sizing or treatment.

Sodium chlorate for the pulp and paper industry continued to be produced by ERCO Worldwide (a division of Superior Plus Inc.) at its Hargrave plant (10 km east of Virden) and by Nexen Inc. at its Brandon plant. Raw material for the ERCO plant is obtained by salt dissolution of the Devonian Prairie Evaporite. Nexen, the world's largest producer of sodium chlorate, presently purchases salt for its Brandon plant from Saskatchewan potash producers. Nexen completed a $60 million expansion of its Brandon plant to 263 000 t/y, making it the world's largest sodium chlorate plant.

Lehigh Cement Ltd. acquired several quarry leases near Harcus on the west shore of Lake Manitoba and began a drilling program to evaluate the gypsum potential. The drilling program is expected to be completed early in 2006.

Tantalum Mining Corporation of Canada Ltd. continued exploration for tantalum- and cesium-bearing pegmatites in the Bernic Lake area in southeastern Manitoba.

Manitoba Geological Survey Activities

The Manitoba Geological Survey (MGS) continued significant in-depth investigations in the Superior Boundary Zone and Thompson Nickel Belt, the Paleoproterozoic Flin Flon Belt, and the Bissett region of southeastern Manitoba. Phanerozoic investigations focused on completing the Williston Basin Targeted Geoscience Initiative (TGI). New field projects were initiated in the Bird River Belt of southeastern Manitoba and the Nejanilini Lake area of Manitoba's Far North.

The MGS published 6 geoscientific reports, 82 maps, and the new Williston Basin TGI web pages. In addition, digital versions of 19 previously out-of-print or print-only publications were re-released; these are now available for free download from the web site.

Partnerships continued to play an important role in Manitoba geoscience investigations. Graduate students carried out directed field investigations that broadened the range of work that the MGS is able to undertake. The Geological Survey of Canada's (GSC) second TGI ended in March 2005, but wrap-up work continued in the Williston Basin Architecture and Hydrocarbon Potential project, and follow-up investigations continued in the Trans-Hudson-Superior Margin Metallotect project. A third, five-year TGI was announced in the February 2005 federal budget. Planning for a major TGI-3 project in the Flin Flon-Snow Lake-Leaf Rapids-Lynn Lake-La Ronge-Creighton area is in progress with the first activities scheduled for late 2005.

In the Paleoproterozoic Flin Flon Belt, researchers from Laurentian University continued work in hangingwall and footwall rocks of the volcanogenic massive sulphide deposits to better understand the volcano-stratigraphic and structural setting of the Flin Flon, Callinan and 777 deposits.

Mapping in the Superior Boundary Zone (SBZ) is being conducted by the MGS in a three-year project that includes as partners Manitoba Hydro, the University of Alberta, Waterloo University, and the GSC. This work will contribute to an understanding of the tectonic configuration of the boundary zone and provides a valuable tool for outlining possible new targets for exploration. Activities in 2005 included:

- mapping in the Split Lake block, by a post-doctoral student at the University of Alberta;
- work on the kinematics of major shear zones, by a post-doctoral student at Waterloo University;
- new mapping by the MGS in the granulite-grade rocks of the Pikwitonei Domain that focuses on resolving the origin of these high-grade rocks at Wintering Lake; and
- work by GSC geologists to follow up previous work in the southernmost transect of the Trans-Hudson–Superior Margin Metallotect TGI project.

The Thompson Nickel Belt is one of the most richly mineralized segments of the SBZ. Work by the MGS in the belt continues to focus on defining the nature and extent of the nickel-hosting Ospwagan Group supracrustal sequence:

- MGS geologists are finalizing a series of 1:20 000 and 1:50 000 geological maps of the exposed and sub-Phanerozoic Thompson Nickel Belt. These maps, developed with industry partners Inco Limited, Falconbridge Limited and HudBay Minerals Inc., are the product of a multi-year collaborative program designed to capture both company and government information on the Thompson Nickel Belt.
- Geochemical, neodymium-isotope and uranium-lead-zircon data were used by the MGS to characterize the mafic-ultramafic volcanic and intrusive rocks of the Bah Lake assemblage at the top of the Ospwagan Group. These data support an interpretation that involves four different episodes of crustal extension and mafic-ultramafic magmatism in the Thompson Nickel Belt.
- The MGS conducted a field-based investigation of the Nejanilini Domain in Manitoba's Far North at the margin of the Hearne craton. Deposition of a Paleoproterozoic cover sequence on the Archean basement is interpreted to record the onset of crustal subsidence in response to continental extension. In this environment, hydrothermal SEDEX-type zinc-lead-silver and magmatic nickel-copper sulphide ore deposits can be expected.

Mineral deposit studies were conducted by the MGS in southeastern Manitoba (Bissett/Rice Lake Belt and Bird River Belt) in support of exploration for gold, nickel, and volcanogenic massive sulphide (VMS) deposits.

Mapping in the Rice Lake Belt has improved the understanding of the regional setting of lode-gold deposits in the Bissett area and has also identified volcanic rocks in the Gem Lake area that may be prospective for VMS deposits.

The MGS facilitated a government-industry-university partnership to study the setting of a variety of mineral deposits in the Bird River greenstone belt. The belt is host to the world-class Tanco pegmatite, which was mined for lithium, cesium and tantalum, and to the Bird River Sill, which has been a focus of nickel, copper and/or PGE exploration since the 1920s. Partners in the Bird River initiative include researchers and graduate students at the University of Waterloo, in part funded by Gossan Resources Limited, Mustang Minerals Corp., Tantalum Mining Corporation of Canada Ltd., the University, and the Natural Sciences and Engineering Research Council of Canada (NSERC). To capitalize on this new initiative, two MGS geologists and their students also began work on aspects of the geology of the region.

A Ph.D. student from McGill University began a study in the eastern Flin Flon Belt to focus on the timing of gold emplacement in a number of gold deposits in the Snow Lake area and along the south margin of the Kisseynew Domain.

In southern Manitoba, the Williston Basin TGI project is aimed at characterizing and understanding basin architecture and hydrocarbon potential. Products in development include a seamless 3-D geological model of Paleozoic and Mesozoic rocks, from basement to outcrop, in a geographic area extending from the northern and eastern outcrop edge to the international boundary and west to 106 west. The first set of Lower Paleozoic structure and isopach maps was released on April 25, 2005, as a web release at the dedicated project web site (www.willistontgi.com), which also hosts all other publications and guidebooks produced for the project. Subsequent map sets (Devonian, Mississippian and Mesozoic) will be released throughout 2005/06. The final report will be completed in 2006.

The MGS continued work on the production of a seamless 1:250 000-scale bedrock geological map for the province. This map is based on the Bedrock Geology Compilation Map Series maps, which are converted to digital format and upgraded with more current content. Other digital initiatives included:

- updating the Manitoba Geochronology Database, last released in 1993, with data collected during the past 12 years; data already in the database have been checked for positional accuracy and a user-friendly front end was developed;

- the addition of digital geophysical data from the cancelled assessment files to the Internet Map Server to enable clients to examine and download datasets; and

- processing of a large till geochemistry dataset, comprising more than 1500 sample locations covering five NTS sheets in the Lynn Lake area, released in November 2005.

MGS mineral education outreach initiatives included the Manitoba Mining and Minerals Convention Schools Program, National Engineering and Geoscience Week, and Provincial Mining Week. The latter offered free hands-on activities developed to complement the earth sciences curriculum and help increase public awareness of Manitoba's mineral resources and mining industry. The event drew more than 3700 visitors from the general public and the school tours program.

A new Prospector Training Program, offered through Manitoba's University College of the North (UCN), was developed through a partnership between the Province, the Government of Canada, the UCN, the Assembly of Manitoba Chiefs, and the minerals sector. The first 11 students to graduate from the course in September 2005 acquired new prospecting skills that included wilderness navigation and survival, mineral identification, regional geology, claim staking, prospecting, and exploration techniques and regulations.

The first Aboriginal Mining Workshop was held as part of the November 2004 Manitoba Mining and Minerals Convention, and was followed up in 2005 with a second successful workshop. The objective of the workshops was to increase awareness of exploration and mining in Manitoba, potential opportunities for community economic development, and Aboriginal participation in the industry.

Incentives

Mineral Exploration Assistance Program (MEAP)

MEAP provides financial assistance of up to 25% of eligible exploration expenditures to a maximum of $300 000 per recipient per fiscal year to companies or individuals undertaking mineral exploration in Manitoba. The program, established in the fall of 1995, aims to increase mineral exploration and stimulate activities that may lead to the development of new mines and industrial mineral deposits. To further stimulate exploration in remote areas and areas affected by mine closures, MEAP was expanded to provide a higher percentage of assistance on eligible expenditures for projects in the Far North, Lynn Lake/Leaf Rapids and Bissett regions. Companies or individuals may qualify for up to 35% of eligible exploration expenditures to a maximum of $400 000 per recipient per fiscal year in these areas of the province.

MEAP has two offerings per fiscal year to coincide with the spring/summer and fall/winter exploration seasons. In April 2005, Manitoba renewed the MEAP program and will offer an additional $7.4 million in funding over a three-year period beginning with the spring 2005 offering.

PROGRAM HIGHLIGHTS FROM OCTOBER 1995 TO OCTOBER 31, 2005

- A total of 139 companies have participated in MEAP, representing 473 exploration projects.
- Of the 139 companies, 100 are considered new to Manitoba, including 7 joint-venture partners; 20 are major exploration companies and 119 are junior companies (a company is considered a major exploration company if its market capitalization is greater than $100 million).
- A total of $18.9 million in assistance has been issued to 473 completed projects.
- A total of $105.7 million in exploration expenses has been reported.
- Reported exploration expenditures under the program indicate that every $1 million in assistance paid generated $5.6 million in exploration expenditures.

Several companies with MEAP-assisted exploration projects had exciting results to announce in 2005:

- San Gold Corporation is planning to have the Rice Lake mine back in production in December.
- Several other MEAP companies are working on major advanced exploration projects:
  - Recent results from a 2005 summer drill program at Crowflight Minerals Bucko nickel-copper deposit near Wabowden have exceeded Crowflight's expectations.
  - Mustang Minerals at the Mayville and Maskwa nickel-copper deposits in the Bird River region is proceeding with its exploration and believes that its Manitoba projects have a unique combination of existing resource, unexplored mineral potential, and access to excellent mining infrastructure.
  - Nuinsco Resources at its Minago nickel deposit near Easterville is conducting studies to determine the viability of an open-pit and/or underground mining project.

- Bema Gold at its Monument Bay project near Red Sucker Lake continued to explore and add to its significant gold resource in northeastern Manitoba.

Manitoba Prospectors Assistance Program (MPAP)

MPAP was introduced in 1992 to provide financial support to self-employed prospectors and increase mineral prospecting in the province. Qualified applicants receive up to 50% of expenditures incurred to a maximum assistance level of $7500 per applicant per year upon completion of the field project and submission of an acceptable report. Additional assistance of up to $1500 per year for the cost of chartered fixed-wing aircraft is available for projects undertaken in more remote areas of the province. In April 2005, MPAP was renewed for another three years at a funding level of $123 100 per year.

Since the inception of this program, 272 projects have been completed with approved expenditures totaling $2 429 892. A total of $1 217 987 in assistance has been paid out.

Manitoba Mineral Exploration Tax Credit (MMETC)

The MMETC was introduced by the Government of Manitoba in April 2002 to promote investment in Manitoba-based exploration projects. The MMETC is a 10% non-refundable personal income tax credit for investors in eligible flow-through shares of qualifying mineral exploration companies and can only be applied against Manitoba tax payable. The MMETC parallels and tops up the 15% federal exploration tax credit. Eligible investments and qualifying exploration activity are tied to federal eligibility, except that substantially all of the exploration activity must be undertaken in Manitoba. Since the MMETC is harmonized with the federal exploration tax credit, the present sunset date for the MMETC is January 1, 2006.

Since November 2004, a reported $20 million has been raised via flow-through-share financings for exploration in Manitoba; however, at this time, it is difficult to accurately determine the amount that will be eligible for the MMETC. The most recent data indicate that close to $60 000 was claimed pursuant to the MMETC in 2002 and approximately $350 000 was claimed in 2003. It still appears that investments qualifying for the MMETC may fulfill one of the objectives of the tax credit–to help support local companies and junior exploration companies operating in the province. (Note: All flow-through-share statistics reported above were compiled from company press releases.)

Assay Credit Program

For the 2004/05 fiscal year, the province allocated $20 000 towards this program. A prospector can earn assay credit coupons for eligible expenditures on exploration work. Coupons can be redeemed for assays of gold, silver, copper, lead, nickel, zinc, molybdenum, chromium, titanium or tin as specified in Manitoba Regulation 64/92. Coupons can also be redeemed for geochemical analysis of other metals not covered in the regulation by obtaining permission from the Assessment Geologist of the Mines Branch.

In fiscal year 2004/05, a total of 15 486 credits were issued to 17 prospectors; 7 prospectors redeemed 4843 credits.

Land Use

Manitoba has passed several acts designed to improve land and resource management and to support economic development and protection of the environment. The mineral resource/land management program facilitates stewardship in the various provincial and municipal land and resource management planning processes. Program goals are directed at facilitating responsible mining and resource development, protecting the environment, minimizing land and resource use conflicts, and providing high-quality land and resource management planning and advisory services to planning authorities, industry, and other land management stakeholders.

Crown Land Planning

Classification, management and policy development for Crown land in Agro-Manitoba is the responsibility of the Crown Land Classification Committee. Major activities of the Crown land management process included developing and implementing Crown land plans, developing Crown land codes and policy, and supervising land use on Crown lands through an integrated management process. Other significant land management activities included evaluating Crown land sale and use proposals, providing technical advice and information on resource management activities, and facilitating land designation under various resource management acts.

Land Use Assessment

The provincial Mines Branch, Land Management Services, provides technical support and advice to many legislative land-use review and assessment processes. A total of 1093 land-use proposals were assessed to ensure that the province's mineral resources were not compromised by surface development and that land-use conflicts were identified and mitigated. A new policy, procedures, and a process for mineral access rights were developed for ministerial approval.

Sustainability

The *Sustainable Development Act* was proclaimed on July 1, 1998. The act creates a legal framework through which sustainable development will be implemented in the public sector and encouraged in private industry and society. An implementation process was approved and initiated in 2005.

Protected Areas Initiative

Manitoba's Protected Areas Initiative helps protect representative landscapes and ecosystems from logging, mining and hydro development. It involves sectoral consultations to ensure that resource industries and communities are consulted on proposals for the establishment of protected areas. Currently, 8.3% of Manitoba is legally protected from mining development with an additional 5.7% supported for protection by the mining sector.

Treaty Land Entitlement

Progress was made towards meeting provincial obligations under the Treaty Land Entitlement, Northern Flood, and Grand Rapids Forebay agreements. One hundred and sixteen land selections covering approximately 154 764 acres were assessed and approved.

More information on exploration and mining in Manitoba is available on the Manitoba Industry, Economic Development and Mines' Mineral Resources Division web site at www.gov.mb.ca/iedm/mrd.

2.8 SASKATCHEWAN[14]

Most Recent Saskatchewan Exploration News

The following three news items provide important updates to information provided in this Saskatchewan review of activities. These events took place after October 1, 2005.

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[14] The Saskatchewan review of activities was prepared by Lynn I. Kelley, Cameron Bartsch, Colin Card, André Costa and Gary Delaney (Northern Geological Survey), and Pam Schwann (Mines Branch, Saskatchewan Industry and Resources). For more information, contact Gary Delaney, Director, Northern Geological Survey (Regina), by telephone at (306) 787-1160 or by e-mail at gdelaney@ir.gov.sk.ca.

- Shore Gold Inc. announced that a correction in the previously reported weight of its bulk samples from the Star kimberlite resulted in increases of reported grades.

- A total of seven sub-surface mineral permits relating to potash exploration were issued in 2005. An additional twelve applications remain outstanding.

- At the end of 2005, the amount of land under mineral dispositions of all types was two times the amount of land in good standing at the end of 2004.

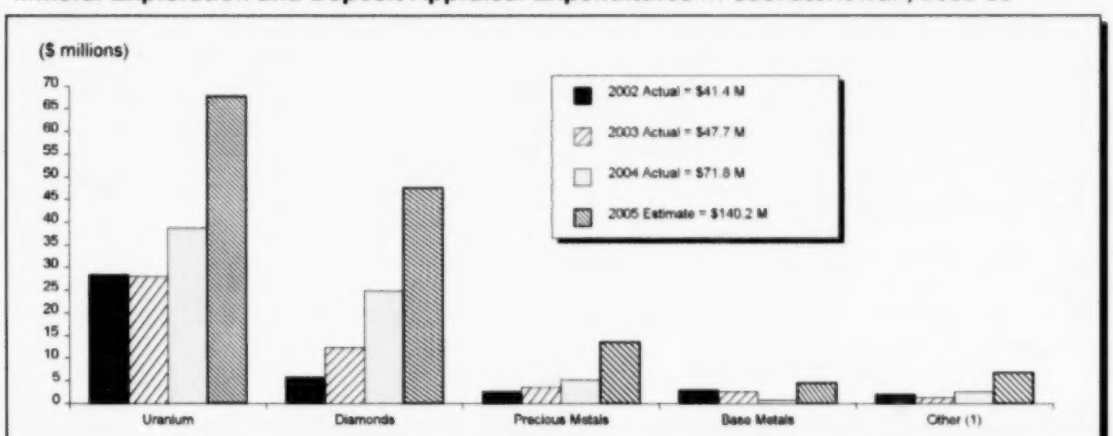
Overview

In 2005, total exploration and deposit appraisal expenditures in Saskatchewan are projected to reach $140 million, approximately doubling actual expenditures of $71.8 million in 2004 (**Figure 25**). These expenditures reflect a significant upturn in uranium exploration and increases in diamond and gold exploration. Saskatchewan remained the pre-eminent producer of potash and uranium, providing about 33% of world supply of the former and 29% of the latter. Gold, copper and zinc, salt, sodium sulphate, aggregate, bentonite, and silica sand were among other mineral commodities produced in 2005.

In 2005, about $67.9 million will be spent on uranium exploration and deposit appraisal, reflecting a 76% increase from the 2004 figure of $38.6 million. This significant increase in uranium exploration, which has been accompanied by a dramatic upturn in staking activity, reflects mounting concerns about looming supply shortages as recorded by a steady rise in the spot market price of uranium from a near-historic low of US$7.10/lb U_3O_8 at the end of 2000 to US$31.25/lb U_3O_8 on September 30, 2005. Nearly all of the activity is in the Athabasca Basin, which contains the largest, highest-grade deposits in the world.

The pace of diamond exploration in the Fort-à-la-Corne district, 60 km east of Prince Albert, continued to accelerate. Exploration and deposit appraisal expenditures for 2005 are forecasted to nearly double those of 2004 to reach $47.6 million. The increase is largely due to the commencement of advanced exploration programs by both Shore Gold Inc. and the Fort-à-la-Corne (FalC) Joint Venture in 2005. In August, Shore Gold and Kensington Resources Ltd. announced plans to

Figure 25
Mineral Exploration and Deposit Appraisal Expenditures in Saskatchewan, 2002-05



Source: Data compiled from the federal-provincial/territorial Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes platinum group elements, rare earth elements, tantalum, industrial minerals and iron.

merge, effectively making the newly consolidated company the largest single player in the Fort-à-la-Corne district. Other active diamond exploration programs include those of Forest Gate Resources Inc. and Great Western Diamonds Corp.

Strong gold prices continued to be a catalyst driving gold exploration during 2005. The price of gold rose from a month-end close of US$429.40/oz on October 29, 2004, to US$473.25 on September 30, 2005. The increase is paralleled by exploration expenditures forecasted to top $13 million in 2005, up 160% over 2004 and 280% when compared to 2003. Claude Resources Inc. has taken several steps towards ensuring continued production from its Seabee gold mine through expansion of the mill and advanced exploration of the Porky Lake and Santoy Lake properties. Numerous other companies continued to explore properties in the La Ronge Gold Belt, and GLR Resources Inc. continued its re-evaluation of the Goldfields camp southeast of Uranium City.

Although exploration for base metals remained minor in comparison to diamonds and uranium, there was an upturn in exploration activity in 2005. Much of the exploration was focused on volcanogenic massive sulphide (VMS) targets in the Flin Flon area by HudBay Minerals Inc.'s subsidiary, Hudson Bay Mining and Smelting, but also included programs in the Wollaston, Glennie, and southern Tantato domains. There was also limited exploration for platinum group elements in 2005 as Colorado-based Trend Mining Corp. completed a grass-roots exploration program in the Peter Lake Domain.

An increase in prices and global demand has sparked the first interest in potash exploration in Saskatchewan in over two decades. Potash production from eight underground operations and two solution mines set an all-time high in 2004 at 15.8 Mt. Whitemud Resources Inc. is currently developing the Gollier Creek kaolin deposit near the village of Wood Mountain. The company is planning on producing meta-kaolin to be used as a cement substitute for high-strength, low-permeability concrete.

Information Sources

This paper is a review of current activity only. Most localities referred to in the text are shown on **Figure 26**. The publication *Geology, and Mineral and Petroleum Resources of Saskatchewan*[15] provides a more comprehensive summary of the economic geology of the province, including historical reserve and production data. Web sources for up-to-date information on all Saskatchewan mineral occurrences are the Saskatchewan Geological Atlas,[16] Saskatchewan Mineral Deposits Index,[17] and Saskatchewan Exploration and Development Highlights.[18] All are available at the Saskatchewan Industry and Resources web site at ww.ir.gov.sk.ca.

Current exploration and deposit appraisal expenditure forecasts and past actual expenditures are compiled from the annual survey of exploration plus deposit appraisal expenditures by Natural Resources Canada. Grade, tonnage, reserve and resource estimates reported herein are from a

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[15] Saskatchewan Geological Survey (2003): *Geology, and Mineral and Petroleum Resources of Saskatchewan*; Saskatchewan Industry and Resources, Miscellaneous Report 2003-7, 173 pp.

[16] Slimmon, W.L. (2005): *Geological Atlas of Saskatchewan*, version 8 (2005); Saskatchewan Industry and Resources, CD-ROM, version 8.

[17] Bennett, R.W. (2005): *Saskatchewan Mineral Deposits Index*; Saskatchewan Industry and Resources, Miscellaneous Report 2005-6, CD-ROM, version 1.0.0.

[18] Kelley, L., Card, C., Bartsch, C., Hughes, C., Modeland, S., Schwann, P., and Delaney, G. (2005): *Saskatchewan Exploration and Development Highlights 2005*; Saskatchewan Industry and Resources, 30 pp.

Figure 26
Mineral Resource Map of Saskatchewan, 2005

Figure 26
Mineral Resource Map of Saskatchewan, 2005

Figure 26 (cont'd)

● URANIUM
Operating Mines
1. McClean Lake (North and South deposits; Sue A, B, C and E deposits; COGEMA Resources Inc., 70%; Denison Mines Ltd., 22.5%; OURD [Canada] Co. Ltd., 7.5%)
2. Eagle Point (Cameco Corp.); ore processed at Rabbit Lake mill
3. McArthur River (P2N Zone deposit; Cameco Corp., 69.805%; COGEMA Resources Inc., 30.195%)

Locations Referenced in Text
4. Cluff Lake (mined out)
5. Cigar Lake
6. Midwest deposit
7. Moore Lake showing
8. Millenium
9. Key Lake
10. Shea Creek
11. Black Lake

Deposits and Past-Producing Mines ●

○ GOLD
Operating Mines
1. Seabee (Claude Resources Inc.), including Porky and Santoy

Locations Referenced in Text
2. Goldfields
3. Jolu (closed)
4. Greater Waddy Lake Projects (Memorial, Tower, Komis, Golden Heart)
5. Bingo Project (Golden Band Resources)
6. Greywacke Project (Masuparia Gold Corp.)
7. Jojay and Fork Lake Projects (Wescan Goldfields Inc.)

Deposits and Past-Producing Mines ○

● COPPER-ZINC
Operating Mines
1. Callinan (Hudson Bay Mining and Smelting Co. Ltd.)
2. Konuto Lake (Hudson Bay Mining and Smelting Co. Ltd.)

Deposits and Past-Producing Mines ●

● COPPER-NICKEL-PGM-GOLD
Rottenstone Past-Producing Mine

Locations Referenced in Text
● COPPER
1. Janice Lake

● RARE EARTH OCCURRENCE
1. Hoidas Lake

• KIMBERLITE OCCURRENCES
1. Sturgeon Lake
2. Fort-à-la-Corne kimberlite field
3. Candle Lake
4. Star Kimberlite

■ POTASH AND SALT
Operating Mines
1. Vanscoy potash (Agrium Inc.)
2. Cory Division potash (Potash Corp. of Sask. Inc.)
3. Patience Lake Division potash solution (Potash Corp. of Sask. Inc.)
4. Allan Division potash (Potash Corp. of Sask. Inc.)
5. Colonsay potash (Mosaic Company)
6. Lanigan Division potash (Potash Corp. of Sask. Inc.)
7. Esterhazy K-1 and K-2 potash (Mosaic Company)
8. Rocanville Division potash (Potash Corp. of Sask. Inc.)
9. Belle Plaine potash solution (Mosaic Company) and fine salt plant (Canadian Salt Co. Ltd.)
10. Unity solution salt mine and plant (Sifto Canada Inc.)
11. Saskatoon chloride-based chemical plant (ERCO Worldwide)

Locations Referenced in Text
12. Jansen Lake Project (Prairie Potash Corp., 85%; Statebanke Potash Corp., 15%)

▲ SODIUM SULPHATE AND POTASSIUM SULPHATE
Operating Plants
1. Whiteshore Lake (Palo) sodium sulphate plant (Millar Western Industries Ltd.)
2. Chaplin Lake sodium sulphate plant (Saskatchewan Minerals - A Division of Goldcorp Inc.)
3. Aisask Lake potassium sulphate plant (Prairie Sulphate Corp.)
4. Big Quill Lake potassium sulphate plant (Big Quill Resources)

Past-Producing Plants ▲

⊛ CLAY RESOURCES
1. Ravenscrag clay quarry (IXL Industries Ltd.)
2. PR-3 clay quarry (Plainsman Clays)
3. Wilcox bentonite plant (Canadian Clay Products Inc.)
4. Gollier Creek Kaolin deposit (Whitemud Resources)

Deposit ⊛

▣ COAL
Operating Mines
1. Poplar River (Luscar Ltd.)
2. Boundary Dam (Shand, Costello, and Utility) (Luscar Ltd.)
3. Bienfait (Luscar Ltd.)

◎ SILICA SAND
Operating Mines
1. Hanson Lake silica sand deposit (Winn Bay Sand)
2. Red Deer River sand deposit (Red Deer Silica)

Source: Saskatchewan Industry and Resources.

variety of public sources, including published reports, public records, corporate web sites and Saskatchewan Mining Association facts sheets. They do not necessarily conform to current Canadian Institute of Mining, Metallurgy and Petroleum (CIM) standards and/or National Instrument 43-101 of the Canadian Securities Administrators. The Department of Industry and Resources and the Government of Saskatchewan do not accept liability for any errors, omissions or inaccuracies that may be included in, or derived from, this report.

Exploration

Uranium

More than 35 companies, some of which are new to the Athabasca Basin, are actively exploring for uranium. Exploration programs ranged from traditional boulder prospecting to sophisticated geophysical methods targeting deeply buried deposits and diamond drilling for regional target testing and follow-up deposit delineation. The largest programs are operated by Cameco Corporation, AREVA subsidiary COGEMA Resources Inc. (COGEMA), and junior UEX Corporation (UEX). Cameco is undertaking a spectrum of programs ranging from greenfields reconnaissance exploration to advanced delineation work. In February 2005, Formation Capital Corporation's Canadian subsidiary, Coronation Mines Ltd., a junior partner (2% interest) with UEM (50% Cameco-50% COGEMA), announced a significant uranium intercept on the Virgin River property west of Cree Lake. Cameco, who operates the project, tested the Dufferin Lake fault with two diamond drillholes. DDH VR-18 had three intersections, the most significant of which was near the unconformity at 791.1 m and returned 5.83% U_3O_8 over 6.4 m, including 2.5 m at 13.86% U_3O_8. At the Eagle Point mine, brownfield exploration programs were re-started in 2003 after a 10-year hiatus and recent drilling has delineated zones of additional reserves. Cameco's published reserves at Eagle Point for the end of 2004 were 14.2 million lb of U_3O_8, up from the 12.5 million lb reported at the end of 2003. The Millennium deposit, a new discovery announced at the end of 2002, is advancing towards the pre-feasibility stage. The deposit is part of the Cree Extension project, partnered by Cameco, COGEMA and Japan-Canada Uranium Co. Ltd. (JCU), and is located southwest of McArthur River. Published reports suggest it contains an indicated resource of 34.6 million lb U_3O_8 at 2.87% U_3O_8 with an inferred resource of 15.8 million lb U_3O_8 at 2.44% U_3O_8.

In 2005, COGEMA's programs also ranged from greenfields to mine area exploration at the McClean Lake property. Many of these programs are joint ventures, some of which are reported in the following paragraphs.

UEX has 13 uranium projects that are either 100% owned, joint ventured, or under option. These projects are in the western, eastern and northern parts of the Basin. On March 18, 2004, UEX signed an agreement with COGEMA to gain a 49% interest in eight (now ten) of COGEMA's west Athabasca properties, including Shea Creek. Under the terms of the agreement, UEX was required to spend $30 million on exploration over 11 years, including a minimum $2 million per year in the first two years. UEX would earn a 12.25% interest for each $7.5 million spent on exploration. On August 24, 2005, UEX announced that it had earned the initial 12.25% interest in the properties by incurring $7.5 million in exploration expenditures on the properties.

Recent drilling at Shea Creek has succeeded in increasing the width of the basement- and sandstone-hosted Anne deposit (40 million lb U_3O_8 at a grade of 2.5-3.0%; not an NI 43-101-compliant resource estimate) to 100 m along a 250-m strike length at a depth of approximately 700 m. The deposit remains open in all directions. For the first time, basement-hosted mineralization has been identified at the Colette deposit, opening the possibility that it contains high-grade basement mineralization similar to that present at Anne. The most significant discovery is the 63B area between Anne and Colette. A directional leg drilled off the discovery hole intersected 27.4% U_3O_8 over 8.8 m, including 58.32% over 3.5 m at a depth of 714 m, 30 m above the unconformity. This is one of the richest intersections ever reported above the unconformity. Exploration on the remaining joint-venture properties ranged from ground electromagnetic (EM) surveys (moving-loop time-domain EM) to modest drill programs.

UEX and COGEMA have staked new ground adjacent to the Black Lake property and have begun a $2.7 million exploration program that will include 8000 m of step-out drilling from the 2004 discovery hole and a further 7000 m of reconnaissance drilling. Ground and airborne geophysics were also planned for the property.

On the east side of the Basin, UEX focused on its Hidden Bay property southwest of the historic Rabbit Lake deposits. UEX partner and project operator, Cameco Corp., was to complete 101 sonic drillholes in order to establish a NI 43-101-compliant resource for the West Bear deposit. The historic Gulf Minerals' resource estimate was 1.26 million lb U_3O_8 at an average grade of 0.44% U_3O_8. The best drill results to date have returned 4.9% U_3O_8 over 10.1 m, including 8.1% over 5.5 m from UEX-026 and 2.9% U_3O_8 over 7.5 m in UEX-031. At depths of 13 to 31 m, the West Bear deposit is one of the shallowest undeveloped uranium deposits in the Athabasca Basin. A $2 million first-phase diamond-drilling program is planned at the Raven and Horseshoe deposits, where Gulf Minerals published a resource of 23 million lb U_3O_8 at an average grade of 0.16%. The drill program is designed to test the continuity of the deposits and to produce a NI 43-101-compliant resource estimate.

Denison Mines Inc. reached an agreement to acquire an additional 5.21% interest in the Midwest project, bringing its total interest to 25.17%. The Midwest project (AREVA subsidiary COGEMA Resources Inc., 69.16%; Denison Mines Inc., 25.17%; and OURD Canada Co. Ltd., 5.67%) is 20 km west of the McClean Lake mine. Denison has released a new NI 43-101-compliant model for Midwest that suggested an increased resource of 345 500 t grading 5.47% U_3O_8, 4.37% nickel and 0.34% cobalt, for a total resource of 41.7 million lb U_3O_8, 33.3 million lb nickel and 2.6 million lb cobalt. An expanded exploration program on the property returned encouraging results highlighted by intersections of 6.25% U_3O_8 over 7.1 m, 11.67% U_3O_8 over 7.7 m, and 1.14% U_3O_8 over 17.7 m from an area to the north of the deposit. Denison also has an agreement with COGEMA to earn a 22.5% interest on the Wolly property by spending $5 million over six years. The Wolly property comprises 23 700 ha and surrounds the McClean Lake operation. Much of the 2005 exploration in the McClean Lake area was focused on that property.

In the southeastern part of the Basin, work continued at the Moore Lake project, a joint venture between International Uranium Corp. (IUC) of Vancouver, British Columbia, and JNR Resources Inc. The 2005 drill program at the Maverick zone yielded more favourable results, highlighted by DDH ML-61 from which a 10-m intersection of 4.03% U_3O_8 included 1.4 m at 19.96% U_3O_8. Step-out and along-strike drilling have expanded the length and width of the Maverick zone. A three-dimensional seismic survey was also completed over the Maverick zone in the winter of 2005. Drilling on other parts of the Moore Lake property has returned favourable geochemistry, suggesting that the mineralizing system was active to the north and northeast of the Maverick zone. New VTEM-aeromagnetic surveys are planned for the Lazy Edward Bay, South Dufferin and Kelic Lake projects in which IUC also has an option to acquire a 75% interest.

Both JNR and IUC are exploring for uranium on other properties. IUC has begun work on its wholly owned Key Lake South project, southwest of Moore Lake. A 2004 airborne EM/aeromagnetic survey was followed up by ground geophysics and a 1500-m winter drilling program in 2005. IUC has also entered into joint ventures with Santoy Resources Ltd. and Consolidated Abaddon Resources Inc.

JNR Resources has a 100% interest in a new property just to the east of the UEX-COGEMA Black Lake property. A 1400-line-km MEGATEM survey was completed and has identified several EM anomalies. The company initiated a follow-up ground program of line cutting and ground geophysics. An additional 17 500 ha of land, inferred to cover the strike extensions of conductors and geochemical anomalies, has been staked.

SXR Uranium One Inc. (formerly Southern Cross Resources Inc.) and Pitchstone Exploration Ltd. became the first joint venture to utilize BHP Billiton's FALCON high-resolution

gravity-gradiometry system in the Athabasca Basin on their Darby/Candle and Waterfound properties. In addition, MEGATEM surveys were flown at the Moon Lake and Lynx properties. Drilling is planned for the Waterfound and Darby/Candle properties.

Numerous other junior companies have also been actively exploring in the Athabasca Basin. The main focus of most of this activity has been airborne geophysical surveys, but in some cases also includes ground geophysics, prospecting, and boulder sampling programs.

Diamonds

The pace of diamond exploration in Saskatchewan achieved unprecedented levels in 2005. Two advanced exploration programs, the pre-feasibility study on the Star Kimberlite by Shore Gold and the Advanced Exploration and Evaluation Plan by the FalC Joint Venture, comprised the majority of the work. Other companies undertook ground and airborne geophysical surveys and surface drilling in and around the Fort-à-la-Corne district.

STAR KIMBERLITE

The Star kimberlite, at the southeast end of the Fort-à-la-Corne kimberlite field, consists mostly of pyroclastic crater-facies rocks covering a footprint area of approximately 200 ha and ranging from 3 m to more than 540 m thick. Within the Star kimberlite, five eruptive events are recognized in Cantuar, Pense, and early, middle and late Joli Fou time. The early Joli Fou kimberlite, with an estimated mass of 240 Mt, is volumetrically the most abundant unit in the Star kimberlite and the underground bulk sampling has focused primarily on this unit in the vicinity of a feeder vent.

The bulk sample completed in the spring of 2005 recovered a total of 33 820 stones with a total carat weight of 4048.81 carats (ct) from 25 252.89 t of dry kimberlite, for an average grade of 16.03 carats per hundred tonnes (ct/ht). The program involved sinking a 4.5-m-diameter vertical shaft to 250 m. Drifts were driven into kimberlite on levels established at 175 m and 235 m below surface. The results indicated a significant difference in the diamond distribution amongst the three phases of kimberlite deposited during Joli Fou time (late Cretaceous). The average macrodiamond grade of batches representing the late Joli Fou was 2.82 ct/ht, whereas the mid-Joli Fou kimberlite average was 6.27 ct/ht. Batch grades for the early Joli Fou averaged 18.36 ct/ht. Several batches contained in excess of 30 ct/ht. The largest diamonds recovered to date are a 19.71-ct aggregate and a 19.68-ct fragment from early Joli Fou kimberlite along the southeast and north drifts on the 235-m level. Two internally flawless 5.41-ct and 4.77-ct octahedron diamonds have also been recovered. In total, 198 diamonds weighed more than 2 ct each, 568 exceeded 1 ct, and 1295 were larger than 0.5 ct. Estimated modeled values are US$135/ct with a minimum of US$110/ct and a suggested high of US$162/ct (not a maximum). Because the bulk sample and the size of the parcel examined were relatively small, US$110/ct is considered by Shore Gold to be a minimum average value for diamonds from the Star kimberlite.

In May 2005, shortly after releasing the final bulk sample results, Shore Gold announced the commencement of a pre-feasibility study on the Star kimberlite. The 30-month program, with a budget of $44 million, features delineation drilling, additional bulk sampling, and a host of environmental and engineering studies. The main objective of the study is to establish a mineral resource compliant with National Instrument (NI) 43-101 by the end of 2007 and includes the extraction of an additional 15 000 t in order to increase the size of the diamond parcel. Some 1500 m of core drilling was completed from the underground workings ahead of bulk-sample drifts on the 235-m level. By late August, 570 m of additional drift had been driven, primarily to the south of the previous workings. The company reported that the drifting had intersected coarse kimberlite rich in macrocrysts and mantle xenoliths. The pre-feasibility study also includes 21 000 m of PQ core drilling on a grid pattern over the Star kimberlite and 72 large-diameter drillholes for the recovery of bulk samples.

FORT-À-LA-CORNE JOINT VENTURE (FalC)

Property held by the Fort-à-la-Corne Joint Venture (De Beers Canada Inc., operator [42.245%], Kensington Resources Ltd. [42.245%], Cameco Corporation [5.51%], and UEM Inc. [carried 10%]) covers 64 drill-tested kimberlite bodies ranging in aerial extent from 2.7 to 250 ha, based on geophysical modeling. The larger kimberlite bodies are commonly composite in nature and made up of multiple eruptive phases of mainly pyroclastic crater-facies deposits. Over $30 million has been spent over the past 15 years exploring the kimberlites within the FalC Joint Venture property. Exploration activity over the past few years has focused on higher-priority bodies including, most recently, the 140/141, 148 and 122 kimberlites.

In early 2005, the FalC Joint Venture accelerated its work with the adoption of an Advanced Exploration and Evaluation Plan (AE&E) outlining a 43-month program with the goal of reaching a decision on going ahead with a pre-feasibility study by mid-2008. The program is focused on higher-grade zones in kimberlites in the southern part of the FalC main cluster on the premise that higher-grade portions of multiple kimberlites may, in aggregate, constitute a resource that can be profitably mined. To date, the FalC Joint Venture has identified 33 million carats (Mct) of diamonds in 369 Mt (non-NI 43-101 compliant) from kimberlites 140/141, 148 and 122.

The 2005 portion of the AE&E included core drilling of some 14 kimberlites, the goal being to assess the economic potential of kimberlites falling within a 5-km radius at the southern end of the main FalC trend. The westward extension of the Star kimberlite onto joint-venture property and kimberlite 134 were identified as top priorities for the 2005 program. The program, budgeted at $25.6 million, called for some 130 HQ core holes and microdiamond analysis on approximately 10 000 kg of core. The program also included a conceptual study of mining from multiple open pits, delineation drilling on selected high-potential targets, mini-bulk sampling on selected kimberlites, and preliminary studies of alternative mining strategies, waste management, infrastructure requirements, metallurgical processes, and environmental baseline conditions.

In August, Shore Gold and Kensington Resources announced plans to merge, effectively making the newly consolidated company the largest single player in the FalC district.

OTHER EXPLORATION

Forest Gate Resources followed up its 2003 discovery of the Dizzy kimberlite with the discovery of the Duke kimberlite on its East Side property. The company has also staked some 52 000 ha south-southeast of the main Fort-à-la-Corne trend to test its possible extension. Great Western Diamond Corp. completed one drillhole on the C29/30 kimberlite and raised funds for further exploration of the Candle Lake kimberlites in 2006.

Gold

High gold prices have sparked renewed interest in historical gold properties and in defining new exploration targets. The east-central region of the province continues to be the main area of interest with over 90% of the exploration taking place in the La Ronge and Glennie domains.

Near the Seabee mine, Claude Resources advanced exploration projects at the Porky Lake and Santoy Lake properties towards the bulk sampling stage. At Porky Lake, three gold-bearing zones (the Porky West, Porky Main, and Porky East zones) have been outlined since its discovery in 2002. Claude Resources recently released an estimated indicated resource of 90 000 t grading 7.33 g/t gold and an estimated inferred resource of 130 000 t grading 5.00 g/t gold for the Porky West zone. The Porky Main zone is estimated to contain an indicated resource of 160 000 t grading 7.50 g/t gold and an inferred resource of 70 000 t grading 10.4 g/t gold.

The Santoy Lake property, located 11.5 km southeast of the Seabee mine, contains multiple gold-bearing zones. Exploration drill programs for zones 8 and 8E returned intersections of up to 35 g/t gold (18.6 g/t gold cut) over 3.03 m, 10.9 g/t gold (9.58 g/t gold cut) over 4.45 m, and 17.1 g/t gold (18.5 g/t gold cut) over 3.2 m. The current inferred resource estimates for the Santoy 8 and 8E zones are 910 000 t grading 8.7 g/t gold (uncut) and 6.1 g/t gold (cut). The Santoy 7 zone contains 190 000 t grading 8.42 g/t gold of indicated resources and 10 000 t at 10.0 g/t gold of inferred resources. The company was recently granted the required permits to proceed with underground bulk sampling of both the Santoy 7 zone and Porky West zone. Ore from both properties is expected to be test-processed at the nearby Seabee mill by early 2006.

During the winter and summer of 2005, Golden Band Resources Inc. launched an aggressive regional exploration program on its wholly owned Waddy Lake and Bingo projects. The program was successful in confirming a wide zone containing ore-grade resources close to the surface in the western part of Tower Lake. Intersections of up to 3.55 g/t gold over 19.5 m and 3.96 g/t gold over 25.2 m were obtained from relatively shallow depths of less than 50 m. Prior to the 2005 program, the estimated indicated mineral resource was 6 162 000 t averaging 1.78 g/t gold at a cut-off grade of 1.0 g/t gold (cut to 12 g/t gold). The inferred resource was 1 178 000 t grading 1.59 g/t gold using a 1.0-g/t gold cut-off grade (cut to 12 g/t gold). Follow-up work was also done on the recently discovered Phantom gold-in-till dispersion train and Dog Creek gold-in-till anomalies in order to determine the source of anomalously high gold values. Work on the Bingo project focused on preparation for driving the exploration decline and confirming the geometry of the Bingo structure.

In 2005, Saskatoon-based Wescan Goldfields Inc. carried out exploration programs on two gold projects in the La Ronge Gold Belt. The Fork Lake project encompasses the Fork Lake, Transom and Tamar properties, as well as the former gold-producing Jasper mine. During 1990/91, Cameco Corp. produced 83 700 oz from 155 000 t at a grade of 18.8 g/t gold from the Jasper mine. Wescan initiated an exploration program designed to confirm the presence of the Jasper shear zone around and adjacent to previously mined stopes at the Jasper mine site and to test the down-plunge continuity of the structure. The results of the drill program confirmed the high-grade nature of the mineralization near existing mine workings, as well as the nugget effect of free gold within the deposit. Intersections of interest include gold grades of 12.24 g/t over a true width of 4.87 m, including 23.85 g/t over 0.71 m, and the discovery of a new structure grading 61.53 g/t gold over a true width of 0.32 m.

Wescan Goldfields also owns a 25% joint-venture interest with Claude Resources in the Jojay project, northeast of LaRonge. Exploration in 2005 focused on further delineating the geometry and grade of the previously defined zones in the property. Significant intersections include 10.52 g/t gold over a true width of 4.84 m within the "Red Zone 1" of hole JJ05-01 and 77.93 g/t gold (uncut) over a true width of 0.77 m within the "Orange Zone" of hole JJ05-02. Wescan Goldfields found the Red Zone to be the most significant of the previously indicated zones with a strike length of 250 m, down-plunge extent of 300 m, and open in both directions. As well as adding confidence to previously indicated zones, the recent work also located a number of new zones that will be the target of future exploration.

Exploration at Masuparia Gold Corporation's Greywacke gold project focused on evaluating the resource potential of the more advanced Greywacke North zone. Hole GW05-82 confirmed the up-plunge continuity of a high-grade shoot within the Greywacke North zone as it intersected a 26.64-m (down hole) interval of 8.20 g/t gold, including a higher-grade interval of 11.93 g/t gold over 16.0 m. Drilling down-dip of the Greywacke North zone intersected a disseminated sulphide zone with a weighted average grade of 1.77 g/t gold over 5.0 m, including 3.76 g/t gold over 2.0 m. Further tests on favourable horizons along strike northeast of the Greywacke North zone intersected minor sulphides with low gold values.

In the northwest corner of the province, GLR Resources Inc.'s Goldfields project, near Uranium City, consists of 33 contiguous mining claims and 5 mining leases covering approximately 27 236 ha that include the Box-Athona mine. In 2005, GLR's primary focus was on confirmation and in-fill drilling required by AMEC (Saskatoon) in order to complete a NI 43-101-compliant resource estimate for the Box gold mine. Gold intersections up to 13.54 g/t over 22.65 m (uncut), and 2.23 g/t over 38.0 m (uncut), including 9.83 g/t over 2 m, were encountered during the program. In the spring, metallurgical work was also done in order to confirm recoveries from the Box mine site. The work showed that a recovery grade of approximately 87% is possible, and indicated that a relatively low-cost processing and environmentally friendly gravity plant could be used to recover the gold with only trace cyanide going into the tailings. The company is currently in the process of completing an Environmental Impact Statement and feasibility study as a prelude to a production decision.

Base Metals

In 2005, mine-area exploration by HudBay Minerals Inc.'s subsidiary HBMS has been in part focused on the interpretation of results from the Flin Flon Targeted Geoscience Initiative (TGI) project undertaken by the Geological Survey of Canada (GSC), Saskatchewan Industry and Resources, the Manitoba Geological Survey (MGS), and Laurentian University. The company is undertaking drill testing of stratigraphic targets generated by this work. The company is also developing three-dimensional models for the Flin Flon and 777 deposits, anticipating that visualization of the deposits in three dimensions will enhance understanding of the stratigraphic and structural relationships and generate exploration targets. The company has also been active on other Saskatchewan properties, particularly in the vicinities of the old Coronation and Birch Lake mines and the Konuto Lake mine. It continues to stake new claims in the province.

Early in 2005, Foran Mining Corp. announced that it had entered into an agreement with Cameco Corp. and BHP Billiton to gain a 100% interest in the Hanson Lake project, which contains the McIlvenna Bay copper-zinc deposit, by paying $3.5 million by the end of May 2006 or by issuing $3 million worth of common shares. In addition, Cameco and BHP Billiton would receive a 1% Net Smelter Return or, alternatively, a $1 million buyout. The McIlvenna Bay deposit has a published reserve estimate of 14 500 000 t of ore grading 0.91% copper, 6.08% zinc, 0.40% lead, 0.45 g/t gold and 23.70 g/t silver.

Golconda Resources Ltd. controls 100% of 10 claim blocks (20 000 ha) in the Wapawekka-Wert lakes area, 30 km east-southeast of La Ronge. In 2005, the company followed up an airborne magnetic survey covering 255 km^2 with a GEOTEM survey and identified several new anomalous zones that warranted drill testing. In addition, 6708 ha of new claims were staked based on the findings of the survey. Drill testing was carried out on three conductive zones. The company reported that two of these zones contain sulphide-rich intersections.

Winnipeg's Wildcat Exploration Ltd. completed a helicopter-borne aeromagnetic and electromagnetic (EM) survey over its Foster River property, which contains the Fable and Sito lakes base-metal showings. Wildcat Exploration hopes to discover economic Broken Hill-type zinc-lead-silver mineralization on this property. It contains five lead-zinc showings, as well as copper and silver showings.

In 2005, Red Dragon Resources Corp. signed option agreements with Hull Consulting to earn a 100% interest in properties including and surrounding the Axis Lake and Currie Lake copper-nickel deposits near Stony Rapids. In April 2005, over 40 anomalies were identified from a 1513-line-km airborne VTEM survey completed over the property. The anomalies are along strike of the known Axis Lake and Currie Lake deposits. Follow-up organic soil-sampling programs completed in the summer yielded promising results near and along strike of the known copper-nickel showings. The Axis Lake and Currie Lake deposits are hosted by noritic sills and have published historic resources of 3 402 000 t grading 0.60% copper and 0.60% nickel, and 47 536 t grading 0.79% nickel, respectively.

Potash

This past year saw the first permits for potash exploration issued in the province in over 20 years. In July 2005, Anglo Minerals Ltd. was granted three sub-surface mineral permits totaling 264 464 acres of Crown mineral lands located 135 km east of Saskatoon. The Jansen Lake project is within 20 km of an operating potash mine near Lanigan. Mineralization occurs in four distinct flat-lying beds in the Patience Lake and Belle Plaine members of the Prairie Evaporite Formation. The four mineralized beds include: the Upper Patience Lake sub-member (6.3 m thick, averaging 22.5% K_2O), the Lower Patience Lake sub-member (4.2 m thick, averaging 25.6% K_2O), the Upper Belle Plaine sub-member (3.3 m thick, averaging 21.3% K_2O), and the Lower Belle Plaine sub-member (4.2 m thick, averaging 16.8% K_2O). The company has submitted an independent technical report completed by North Rim Exploration Ltd. that estimates the resource potential (not NI 43-101-compliant) for the Jansen Lake project at approximately 300 Mt (inferred and indicated) of recoverable potash.

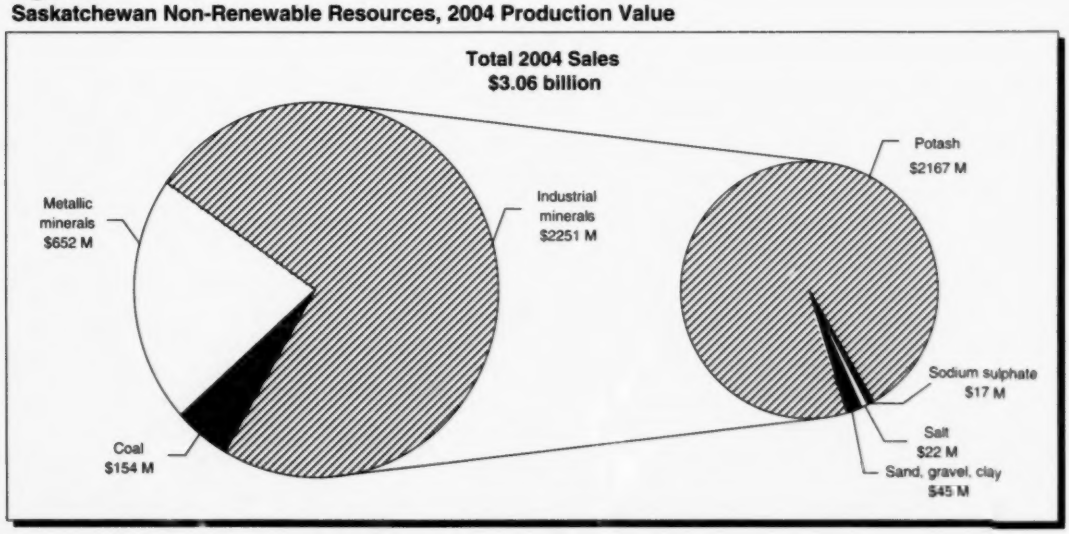
Other Industrial Minerals

Whitemud Resources Inc. is currently developing the Gollier Creek kaolin deposit near the village of Wood Mountain. The company is planning on producing meta-kaolin to be used as a cement substitute for high-strength, low-permeability concrete. Great Western Minerals continued its work on the Hoidas Lake rare elements property in 2005. Through new drilling and geophysical surveys, it was able to expand the mineralized JAK zone and discovered new mineralization nearby.

Mineral Production

In 2004, Saskatchewan's 28 mining operations produced 12 different commodities including potash, salt, coal, uranium, gold, silver, copper, zinc, sodium sulphate, silica sand, clay and bentonite (**Figure 27**). Saskatchewan mineral production (excluding coal) in 2004 generated $2.89 billion worth of sales. In 2005, the value of mineral sales is projected to top $3 billion, reflecting increased commodity prices. In terms of non-fuel mineral production, Saskatchewan was the third largest producer in Canada behind Ontario and Québec in 2004.

Figure 27
Saskatchewan Non-Renewable Resources, 2004 Production Value



Source: Saskatchewan Industry and Resources.

Industrial Minerals

Industrial minerals are a substantial component of the non-renewable resource sector in Saskatchewan. They have consistently accounted for up to 80% of the gross value of provincial mineral production during the past 30 years. Not including coal, the four major products are potash, salt, sodium sulphate and aggregate, with minor production in structural clay, silica sand, and clinker, a naturally fired brick made from mudstone and bentonite. Saskatchewan continues to be the pre-eminent producer of potash in the world with three companies operating eight conventional and two solution mines. The mines combined to produce a record 15.8 Mt of potash in 2004, an increase of 9% over 2003. The total value of production in 2004 was $2.17 billion. Additional resources of 14 billion t mineable by conventional methods and 42 billion t mineable by solution methods have been identified.

Uranium

Uranium mining continued at two operations throughout 2005, the Eagle Point mine at Rabbit Lake and the McArthur River mine, and was re-initiated at the McClean Lake mine in the fall. Industry forecasts uranium production for the year to total 30.0 million lb of U_3O_8. Ore from the Eagle Point mine is processed at the Rabbit Lake mill and that from McArthur River is processed at the Key Lake mill. Processing of stockpiled ore in the Jeb mill at McClean Lake was ongoing. In December 2004, the Canadian Nuclear Safety Commission issued a full construction licence for Cigar Lake. Global uranium industry leaders Cameco Corporation and AREVA subsidiary COGEMA Resources Inc. operate all of the aforementioned mines and processing facilities and control most of the identified resources in the Athabasca Basin.

McARTHUR RIVER MINE/KEY LAKE MILL

The McArthur River mine is owned by Cameco Corporation (69.805%), as the operator, and AREVA subsidiary COGEMA Resources Inc. (30.195%). The two companies also own the Key Lake mill, which is also operated by Cameco. Cameco holds an 83.333% interest and COGEMA Resources owns the remaining 16.667%.

McArthur River is the largest high-grade uranium deposit in the world with proven and probable reserves of 419.5 million lb of U_3O_8 and an average grade of 24.6% U_3O_8. Grades within the orebody reach 70% U_3O_8 locally, and composite grades of 30% U_3O_8 over several metres in thickness are common. Uranium ore is structurally controlled by the P2N fault, which dips 45° to 60° to the southeast and has a 70-m average vertical offset from the Athabasca Group unconformity. Ore is hosted within Athabasca Group sandstone, the fault zone, and basement pelitic gneiss of the Wollaston Supergroup.

In 2004, production at the McArthur River/Key Lake operations was 18.7 million lb of U_3O_8. Cameco Corporation has applied for an increase in annual licensed capacity at the Key Lake mill to 22 million lb of U_3O_8 from the current 18.7 million lb. In the first nine months of 2005, about 14.9 million lb of U_3O_8 were produced at McArthur River.

RABBIT LAKE-EAGLE POINT MINE

In 2004, production from the Eagle Point mine (fully owned and operated by Cameco Corporation) was 5.4 million lb of U_3O_8, down 8% from 2003. The Rabbit Lake facility is now the longest running uranium mining-milling operation in Saskatchewan. Reserves as of December 31, 2004, were 14.2 million lb of U_3O_8, 1.7 million lb of U_3O_8 more than reported a year earlier. This reflects continued exploration success at the site in 2004. That ore is targeted to feed the mill facility until the start-up of the Cigar Lake mine scheduled for 2007. Production through the first nine months of 2005 was 4.5 million lb of U_3O_8.

McCLEAN LAKE

In 2004, the McClean Lake operation (COGEMA Resources Inc., operator [70%], Denison Mines Inc. [22.5%] and OURD (Canada) Co. Ltd. [7.5%]) produced 6.0 million lb of U_3O_8 from stockpiled ore from the Sue C deposit. As of December 2004, reserves, including both stockpiled and in-situ ore, were 32.9 million lb of U_3O_8 with an average grade of 1.6%. For the first nine months of 2005, McClean Lake produced 4.46 million lb of U_3O_8, with the total production for the year forecasted to be 5.5 million lb of U_3O_8. Expansion of the JEB mill began in the second quarter of 2005. In order to process Cigar Lake ore in 2007, a capacity increase from the currently licensed annual production of 8 million lb of U_3O_8 to 12 million lb of is required. Excavation of the open pit to mine the previously approved Sue A orebody began in 2005 and stripping of the Sue E orebody began in September. Also at McClean Lake, COGEMA received approval to use blind-boring/jet-boring techniques to test-mine small, high-grade deposits such as McClean North and Caribou.

CIGAR LAKE

Cigar Lake is the world's second largest high-grade uranium deposit with total proven and probable reserves of 231.5 million lb of U_3O_8 at an average grade of 19.06% U_3O_8. Total inferred resources are 118.2 million lb of U_3O_8 at an average grade of 16.92% U_3O_8. Cigar Lake is owned by Cameco Corporation, operator (50.025%), COGEMA Resources Inc. (37.100%), Idemitsu Uranium Exploration Canada (7.875%) and TEPCO Resources Inc. (5.0%).

In December 2004, the Canadian Nuclear Safety Commission granted a full construction licence for this project. Construction began on January 1, 2005, and is expected to take 27 months. Underground mining is targeted to commence in 2007, pending completed regulatory approval and favourable market conditions. Production will be ramped up over a period of three years before achieving full production levels of 18 million lb of U_3O_8. Mining at Cigar Lake will be done in two phases. Phase I will extract the high-grade eastern part of the orebody and will last for 15 years. After a three-year phase-in period, the optimal annual production is targeted at 18 million lb of U_3O_8. Phase II will extract the remaining lower-grade portion of the orebody. It will last for approximately 25 years with targeted annual production lowered to 6 million lb U_3O_8. The total capital cost to put Cigar Lake into production is estimated at $450 million, which includes building surface and underground facilities, and changes to the McClean Lake and Rabbit Lake mills where the ore will be processed.

Gold

Claude Resources' 100%-owned Seabee mine is located 120 km north-northeast of La Ronge in the central part of the Glennie Domain. In 2004, the mine produced 41 200 oz of gold from 187 000 t of ore milled at a grade of 7.15 g/t gold. Production in the first half of 2005 was 109 600 t milled at a grade of 6.30 g/t gold, for a total yield of 20 700 oz. Total production is expected to reach 46 000 oz in 2005. Since it opened in 1991, the mine has produced over 670 000 oz of gold.

The current mine plan is focused on the 161 and 162 zones at the 395 and 490 levels, as well as the 2B and 2C zones from the 680-m and 750-m-level stoping blocks. Plans are also under way to extend the decline to the 800-m level in order to begin the 770-m-level cut and fill stope. Throughout 2005, the company has placed a strong emphasis on underground diamond drilling in order to upgrade resource and reserve estimates. Total underground drilling is expected to exceed 40 000 m this year. Recent drilling has intersected structure and economic grades at the 1000-m level, approximately 300 m below the current workings.

Work on the Seabee mill expansion began in the spring of 2005 and is expected to be complete later this fall. The $2 million project will double the capacity of the mill from 550 tonnes per day (t/d) to 1100 t/d, providing greater flexibility in the mining schedule and accommodating any possible feed stock that may result from nearby properties currently in the advanced exploration stages.

Base Metals

In 2005, base metals were produced exclusively from the Flin Flon Domain in the east-central part of the province. They were mined from the Konuto Lake deposit and that part of the Callinan deposit located in Saskatchewan. Both deposits are volcanogenic massive sulphide deposits of Paleoproterozoic age.

The Callinan deposit consists of three east-plunging zones (South, East and North) within a sequence of rhyolitic rocks that are likely equivalent to the host rock ("mine rhyolite") of the Flin Flon mine. Only the upper part of the Callinan North deposit extends into Saskatchewan. From its start-up in April 1990 through 2003, the Callinan mine produced 6 462 556 t of ore grading 1.41% copper, 3.98% zinc, 2.14 g/t gold, and 24.68 g/t silver. The Saskatchewan part accounted for 359 027 t grading 1.50% copper, 3.81% zinc, 1.70 g/t gold and 15.74 g/t silver. Saskatchewan production in the first eight months of 2004 was 23 716 t of ore grading 1.41% copper, 3.02% zinc, 1.58 g/t gold and 15.60 g/t silver from the North zone lens. Production for the remainder of the year is estimated at 15 000 t of ore grading 1.20% copper, 2.98% zinc, 1.54 g/t gold, and 16.46 g/t silver. As of January 1, 2004, mineable resources in the Saskatchewan part of the North zone were 364 160 t grading 1.21% copper, 3.15% zinc, 1.55 g/t gold and 19.06 g/t silver.

The Konuto Lake deposit is a mafic-hosted, back arc, rift-type copper-zinc deposit. The north-northeast-striking, near vertical dipping and steeply south-plunging deposit has a strike length of approximately 180 m. The copper-zinc-gold-silver ore is in five sulphide lenses, including four massive sulphide lenses (Lenses 1, 3, 4 and 5) in a broad zone of oblique-reverse faulting.

As of January 1, 2004, the deposit's proven and probable reserves stood at 0.5 Mt of ore grading 3.90% copper, 1.40% zinc, 2.10 g/t gold, and 8.60 g/t silver, and no mineable resources. Since production began in 1998 until the end of 2004, the mine produced 1 720 546 t of ore. Production for 2004 was 327 231 t of ore grading 4.07% copper, 2.08% zinc, 1.92 g/t gold and 9.60 g/t silver. An additional 235 889 t of ore was to be mined in 2005 before the anticipated mine closure in the fourth quarter. Published production figures for the first two quarters of 2005 were 89 986 t of ore grading 4.47% copper, 1.66% zinc, 1.84 g/t gold and 9.28 g/t silver.

Saskatchewan Crown Land Tenure Activity

From January 1 to October 1, 2005, a total of 1233 "new" metallic mineral dispositions covering 3.4 Mha were acquired. The majority (87.5%) of the area was acquired in the unsurveyed part of the province and was related to uranium exploration. Only 193 metallic mineral dispositions covering 120 251 ha lapsed in the same period.

A steady increase in the uranium price from US$13/lb to over US$33/lb, combined with promising diamond exploration results, has continued to spur increased staking activity in 2005. In the north, 444 new claims (1.3 Mha) and 47 permits (1.7 Mha) were acquired in this period, primarily related to uranium exploration activity in and adjacent to the Athabasca Basin, and 742 new claims (435 699 ha) were acquired in the surveyed part of the province.

The total number of metallic mineral dispositions in good standing on October 1, 2005, was 5199 dispositions covering a total of 6.8 Mha, which is more than 2.5 times the amount of land under disposition on October 1, 2004. A comparison of the total number and types of active Crown metallic and industrial mineral dispositions is shown in **Table 14**. On October 1, 2005, there were a total of 6189 mineral dispositions and they covered 7.3 Million ha.

TABLE 14. SASKATCHEWAN CROWN METALLIC AND INDUSTRIAL MINERAL DISPOSITIONS

Category	December 2004		October 1, 2005	
	(no.)	(hectares)	(no.)	(hectares)
Mineral claims	4 072	3 441 438	5 059	5 040 192
Mineral permits	2	25 600	49	1 723 622
Mineral leases	109	31 265	91	28 856
Alkali leases	55	12 422	55	12 422
Coal leases	774	121 347	776	121 351
Quarry leases	115	3 744	144	11 176
Potash dispositions	12	217 729	15	329 229
Total	5 139	3 853 545	6 189	7 266 848

Source: Saskatchewan Department of Industry and Resources.

Assessment Work

To October 1, 2005, a total of $12.9 million in assessment work expenditures had been approved and $20.3 million worth of work had been applied to maintain dispositions in good standing. Uranium-related assessment work represented 30% of approved expenditures while work related to diamond exploration activities represented 59% of approved expenditures.

Government Incentive Programs

Saskatchewan Mineral Exploration Tax Credit (SMETC)

In December 2001, Saskatchewan introduced a new temporary 10% tax credit for flow-through-share investors of eligible mineral exploration companies. The program parallels the federal 15% Investment Tax Credit for Exploration (ITCE). The intention of the program is to stimulate grass-roots mineral exploration, principally for metallic minerals (including diamonds). The non-refundable tax credit applies to eligible exploration expenses incurred on or after October 18, 2000, and before January 1, 2005. While there have been a number of administrative challenges, the SMETC is popular with industry and has exceeded the projected $300 000 annual allocation. Companies applying for permission to issue the tax credit are primarily focused on diamond and uranium exploration.

Saskatchewan Mineral Exploration Incentives

In September 2002, the Saskatchewan government announced a six-year, $12.6 million package of mineral exploration incentives that includes:

- the Prospectors Incentive Program ($100 000/y);
- the Company Incentive Program ($1.1 million/y);
- enhanced geoscience funding ($400 000/y) – multi-parameter airborne geophysics;
- a 10-year royalty holiday for new gold and base-metal mines;
- the development of a competitive diamond royalty and tax structure; and
- a fuel tax rebate.

Corporation Exploration Incentive Program

This program offers reimbursement of up to 25% of approved eligible expenditures to a maximum of $100 000 per applicant, with a maximum of one approved project per applicant per year upon approval of a technical report and expenditure statement. In the 2004 program year, 22 companies with projects totaling $14.4 million accessed this program. Due to oversubscription, funding to companies was pro-rated. Each company received funding equal to approximately 62% of approved expenditures. For the 2005 program year, there are 31 applicants with proposed exploration budgets

totaling $29.1 million. Exploration programs are targeting a diversity of minerals over a wide geographic area of the province.

Prospectors Incentive Program (PIP)

This program offers reimbursement of up to 50% of approved eligible expenditures to a maximum of $7500 per applicant, with a maximum of one approved project per applicant per year upon approval of a technical report and expenditure statement. This program has not yet been fully subscribed to. This situation may relate to the low number of existing prospectors and the predominance of uranium and diamond exploration programs, which typically utilize geophysical over prospecting methods. In 2004, nine applications for PIP, representing projects totaling $132 000, were received. For the 2005 program year, 11 applications were received. The undersubscribed portion of the 2005 program was used to assist in the development and implementation of a Mineral Exploration Technician Program that was run early this winter in partnership with the exploration industry and educational institutes in northern Saskatchewan. The successful five-week course, which was based out of the Key Lake mine, assisted in addressing both the shortage of skilled exploration technicians available and in increasing the participation of residents from northern Saskatchewan communities in benefiting from increased exploration activity in Saskatchewan. Most of the 16 graduates of the course are now employed in the exploration sector.

2.9 ALBERTA[19]

Overview

During 2005, there were 573 mineral permit applications accepted and 5.2 Mha (approximately 13 million acres) staked for minerals within Alberta (**Table 15**). Exploration activity was up slightly in 2005 relative to 2004 when there were 533 permit applications for about 4.7 Mha staked within Alberta. As of December 31, 2005, there were 1333 mineral permits in good standing encompassing over 9.9 Mha; in contrast, at year-end 2004, there were 866 mineral permits encompassing about 6.3 Mha of land in good standing.

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[19] The Alberta review of activities was prepared by R.A. Olson, D.R. Eccles, D. Pana, W.A.D. Edwards (Alberta Geological Survey of the Alberta Energy and Utilities Board) and A. Maslowski (Alberta Department of Energy). For more information, the reader is invited to contact Dr. Reg Olson by telephone at (780) 427-1741 or by e-mail at reg.olson@gov.ab.ca.

TABLE 15. CLAIMS STAKED AND ASSESSMENT WORK FILED IN ALBERTA, 2001-05

Activity	2001	2002	2003	2004	2005
Claims staked (permits (1) applied for)					
Number of applications accepted (no.)	..	522	322	533	573
Total area (Mha)	2.5	4.1	2.9	4.7	5.2
Permits in good standing					
Number of agreements (no.)	..	1 409	1 276	866	1 333
Active hectares (Mha)	8.2	11.2	10.2	6.3	9.9
Filed mineral assessment reports					
Number of reports (no.)	14	14	10	24	10
Number of permits represented (no.)	255	203	44	184	40
Hectares represented (Mha)	2.0	1.4	0.2	1.2	0.2
Expenditures filed ($ millions)	2.0	11.8	0.6	0.9	0.9

Source: Alberta Geological Survey, Alberta Energy and Utilities Board.
(1) In Alberta, mineral claims for exploration are called metallic and industrial mineral permits.
.. Not available; Mha Millions of hectares.

With respect to the primary commodities being explored for, about two-thirds of the hectares staked in 2005 was aimed at uranium targets, with the majority of the remaining lands staked for the pursuit of diamondiferous kimberlites. As well, there were a few mineral claims staked for base metals, gold and iron.

Information about the geology of Alberta can be found on the Alberta Geological Survey (AGS) web site at www.ags.gov.ab.ca. Information about the current mineral claim activity in Alberta can be found on the Internet at the Alberta Department of Energy's interactive map at www.energy.gov.ab.ca/com/RLA/Maps/Metallic+and+Industrial+Minerals+Activity+Maps.htm.

Diamondiferous Kimberlites

With the success of diamond projects in Saskatchewan, Ontario and Québec, diamond companies regained interest in Alberta where about 1.73 Mha (about 4.3 million acres) were staked during 2005 by both junior and major diamond companies. This staking showed a renewed awareness of the potential for economic diamondiferous kimberlites to exist within Alberta. This new staking was focused not only in areas of known kimberlite occurrences (e.g., the Mountain Lake, Buffalo Head Hills and Birch Mountains kimberlite fields), but also in several underexplored areas along the foothill region of the Rocky Mountains (e.g., near Brazeau River, Blackstone River, and Rocky Mountain House), and the Swan Hills, Calling Lake and St. Paul-Cold Lake regions of north-central to northeastern Alberta.

Perhaps the most notable company to newly enter the Alberta diamond exploration scene was Diamondex Resources Ltd., which staked 120 metallic mineral permits totaling approximately 2.5 million acres in the St. Paul-Cold Lake area about 185 km northeast of Edmonton. The property, which is referred to as the Pegasus project, was acquired on the basis of kimberlite indicator minerals (including significant concentrations of G10 pyrope garnet, chromite, diopside and ilmenite), as well as interpreted geophysical targets. Diamondex stated it plans to spend about $500 000 on its new play, including a limited drilling program. Other companies staking either adjacent to Diamondex or north of the Cold Lake Air Weapons Range include Marmac Mines Ltd. and Sandswamp Exploration Ltd.

Whereas new staking may produce exciting future discoveries of diamondiferous kimberlite, the heart of the current Alberta diamond play remains in the Buffalo Head Hills region, which is approximately 400 km north of Edmonton. In the Buffalo Head Hills, Ashton Mining of Canada Inc. and its joint-venture partners EnCana Corporation and Pure Gold Minerals Inc. have thus far discovered 38 occurrences of kimberlite, 26 of which are diamondiferous. Ten-tonne mini-bulk samples have been collected from five of these bodies (specifically, K6, K11, K14, K91 and K252) with three pipes (K14, K91 and K252) having diamond contents greater than 10 carats per hundred tonnes (ct/ht). Two of these kimberlites (K14 and K91) have an estimated diamond content of 12 ct/ht and 13 ct/ht, respectively, are both approximately 5 ha in diameter, and are exposed at surface or subcrop under shallow till. The near-surface dimensions of these pipes raise the possibility that a marginal-grade pipe with aerially extensive surface dimensions might produce a mine in Alberta.

The search for an economic-grade diamond deposit has not diminished, especially with Ashton's best results to date coming from a preliminary mini-bulk (22.8-t) sample of kimberlite K252 that contained an estimated diamond content of 55 ct/ht, with one particular breccia lithology having an estimated grade of 85 ct/ht. Because of the deep overburden (70 m to 75 m) and relatively small size (<2 ha) of this pipe, the results to date for K252 suggest that this body is unlikely to be economic. Ashton drilled three geophysical targets in the fall of 2005, each of which had electromagnetic and gravity signatures approximately 500 m in width, but they did not intersect kimberlite.

Grizzly Diamonds Ltd. also has a large land package in the Buffalo Head Hills area and recently completed airborne magnetic and ground magnetic and electromagnetic surveys on its Smokey the

Bear and White Bear properties. In November 2005, it announced the discovery of two kimberlite boulders on its Smokey the Bear property. The kimberlite was discovered within quaternary till and gravel deposits while ground crews were prospecting and sampling.

Prospecting for diamondiferous kimberlites continues or has been recently initiated in several other parts of Alberta. For example, Blue Diamond Mining Corp., Dahrouge Geological Consulting Ltd., Sandswamp Exploration Ltd. and Geolink Exploration Ltd. continue to explore for diamondiferous kimberlites in the Birch Mountains in northeastern Alberta. Past exploration identified eight kimberlites in the Birch Mountains area, but all are either non-diamondiferous or only weakly diamondiferous. As well, the Calling Lake area in north-central Alberta, which has favourable kimberlite-indicator mineral chemistries, continues to attract exploration companies and is currently being explored by Grizzly Diamonds Ltd., Buffalo Gold Ltd., Halmco Inc., Pan Ventures Ltd., and various independent prospectors. The Whitecourt and Swan Hills areas of northwestern Alberta are other new areas of interest and mineral permits have been acquired by Re-creative Developments Ltd., various numbered companies, and a few independent prospectors. Finally, several prospectors have staked claims southwest of Edmonton and in the Hinton and Cardinal River areas within the Foothills. As of yet, however, few exploration results have been reported at these newly active areas of diamondiferous kimberlite exploration within Alberta.

Energy Minerals (Uranium and Thorium)

Due to the fivefold increase in the spot market price of uranium over the past four years (i.e., from US$7.23/lb U_3O_8 in January 2001 to US$36.50/lb U_3O_8 in early January 2006), there has been renewed interest in uranium exploration in Canada after over a 20-year lull in most jurisdictions, except perhaps Saskatchewan. As a result, there has been increased staking for uranium within Alberta during the latter part of 2004 and especially during 2005 when about 3.47 Mha were staked with uranium as the primary exploration target. This staking has been for three main uranium target types and in two main areas: in northeastern Alberta for unconformity and vein-type uranium deposits in the area underlain by Precambrian basement rocks (this staking has included all or most of the area underlain by Lake Athabasca within Alberta), and in southern Alberta for sediment-hosted uranium deposits, particularly in central Alberta west of Red Deer, and in southern Alberta stretching from near Calgary south to Pincher Creek and then east to the Cypress Hills.

Unconformity and Vein-Type Uranium Deposit Exploration Activity in Northeastern Alberta

Industry participants involved in exploration or ground acquisition during 2005 in northeastern Alberta (Precambrian) include: Canalaska Ventures Ltd., Cogema Resources and Cameco Corp. at Maybelle River, Dahrouge Geological, North American Gem Ltd., Red Dragon Resources, Sandswamp Exploration Ltd., TRIEX Minerals Corporation, Paradigm Geological Pty Ltd., Dracula Services Ltd., and a few other individuals and companies.

Little information is available yet about most of the exploration activity for uranium in the Athabasca Basin in northeastern Alberta. However, Ken Wheatley and Craig Cutts of AREVA (a subsidiary of Cogema Resources Inc.) stated in a paper presented at the International Atomic Energy Agency meeting in Vienna in late June 2005 that "The Maybelle River project in northeastern Alberta hosts a uranium prospect named the Dragon Lake zone. This mineralized zone is typical of the Athabasca Basin and lies mostly with the basal formation (Fair Point formation) of the Athabasca Group. The mineralization overlies a graphitic shear zone (the Maybelle River shear zone) . . . The mineralization, as currently defined, is approximately 110 m in strike length, varies from 1 to 40 m in height, and is narrow at 1 to 5 m wide. The mineralized zone trends 160° and cuts across the north-trending shear zone at an oblique angle. Grades vary from several ppm (parts per million) up to 54.5% uranium. Associated elements are nickel, arsenic, cobalt, copper, lead, molybdenum and boron. The mineralized zone is small but remains open along strike. The potential for

further mineralization along the Maybelle River shear zone is high."[20] AREVA has not yet released a resource estimate (tonnes and average grade, or approximate contained uranium poundage) for the Dragon Lake zone.

In June 2005, Red Dragon Resources Corp. optioned the mineral rights for an area it calls the Rae project, which surrounds Cogema's Maybelle project in the western Athabasca Basin. In August 2005, Red Dragon entered into an agreement with Uranco Inc. to acquire a 50% interest in the property. Uranco committed to fund the exploration program on the Rea project starting with US$1 000 000 in the first year, followed by US$2 000 000 in the second year and US$3 000 000 in the third year. The uranium exploration program is staged as follows: airborne geophysical surveys, followed by ground geophysical surveys to determine the best drill targets and, finally, drill testing of selected targets. To date, a deep-penetration, high-resolution airborne electromagnetic survey (VTEM) has been conducted by Geotech Airborne Ltd. on the Rae project, but the company has released no added results at this time.

Triex Minerals Corporation owns the mineral rights to an 89 000-ha (approximately 220 000 acres) property near the south shore of Lake Athabasca, identified as Old Fort Bay. The company positively interprets previous drilling reported from Old Fort Bay that indicated uranium values up to 292 ppm, as well as gold values of 0.08 oz/ton and enrichment of nickel, zinc and silver. A paper published by the Geological Survey of Canada in 1982 suggests that the drilling results obtained may indicate a geochemical halo around an ore deposit. A 3000-line-km MEGATEM airborne survey of the property has been completed by FUGRO, and ground geophysical exploration was planned over favourable anomalies detected by the airborne survey.

Strathmore Minerals Corporation, which has stated it specializes in the strategic acquisition and development of uranium properties worldwide, owns mineral rights over large areas of the remaining portions of the Athabasca Basin in Alberta, as well as the southern portion of the Alberta Shield along the northern rim of the basin at and near the northern shore of Lake Athabasca. To date, no exploration work has been publicly reported by Strathmore.

Canalaska Ventures Ltd. stated in August that it planned the imminent commencement of deep penetrating airborne electromagnetic surveys over its property holdings in the Western Athabasca Basin. The MEGATEM II surveys will cover over 6000 line-km of shallow lake-covered areas, including parts of Lake Athabasca, that have not previously been evaluated because of historical technical limitations to electromagnetic surveys in lake environments. They state that the high-definition MEGATEM II surveys will provide immensely superior power levels and digital data imaging, and are expected to define major geological structures, conductive zones, and trends normally associated with uranium deposits found elsewhere in the basin. The company also announced the commencement of marine seismic surveys for the company's Lake Athabasca property holdings. A third crew working for the company, in conjunction with Frontier Geosciences Inc. of North Vancouver, will carry out hydrographic and high-resolution seismic reflection surveys across the project areas to model lake depths, bedrock topography, and the depth of the Athabasca sandstone-basement unconformity contact. It suggests that these areas of high background uranium, combined with the presence of major basement structures and unconformity-style uranium mineralization, demonstrate the potential for world-scale uranium deposits. A follow-up drilling program was intended for winter 2005/06 with the starting date depending on the ice thickness. No reports on the results of the geophysical surveys or drilling have been announced to date.

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[20] Note that this quote is taken directly from the paper by Wheatley and Cutts (2005). The Alberta Energy Utilities Board/Alberta Geological Survey make no warranty with respect to the accuracy of any company statements reported on herein with respect to their exploration results or activities within Alberta.

Finally, there has been little information released about uranium exploration results north of Lake Athabasca where there is potential for structurally controlled vein-type deposits similar to those that exist in Saskatchewan in the formerly active Beaverlodge Lake (Uranium City) camp. Recent reconnaissance geological work on the Alberta Shield by the AGS included re-examination and sampling of several previously reported mineral occurrences. Around one of these occurrences, on the south side of the Bonny fault, the AGS has defined a 100-m by 600-m zone of increased radioactivity that warrants further exploration work. Samples collected from this and other sites on the Alberta Shield are currently being studied in cooperation with the University of Alberta. The microscopic identification of uranium oxides within carbonate-quartz veins near Bonny fault, in a setting similar to the Beaverlodge uraniferous district of Saskatchewan, is a favourable premise for further exploration of the area.

Sediment-Hosted Uranium Exploration Activity in Southern and South-Central Alberta

Companies involved in ground acquisition in southern Alberta for sediment-hosted uranium deposits include: Dahrouge Geological Ltd., Firestone Ventures Inc., International Ranger Corp., Marum Resources Inc., North American Gem Inc., Sandswamp Exploration Ltd., Rock Ridge Geological Ltd., Commander Petroleum Ltd., and a few other individuals or companies.

Reconnaissance prospecting for sediment-hosted (predominantly sandstone) uranium in southern Alberta was conducted in the past and is documented in various assessment reports that are on file with the AGS. During the early 1990s, the AGS contracted the preparation of a metallogenic evaluation of Alberta; that work resulted in AGS Open File Report 1994-08. This AGS report contains references to a few selected sites in the Cretaceous Willow Creek formation along the Waterton River that produced anomalous radioactivity of up to 2000 counts per second (cps) (by SRAT SPP2N scintillometer) and a rock sample that assayed greater than 2000 ppm uranium, 13 ppm molybdenum and 78 ppm vanadium. These results were a primary impetus for the uranium-staking rush in southwestern Alberta that started late in 2004 and continued through the entire first half of 2005. The favourable stratigraphy for sediment-hosted uranium deposits comprises several Cretaceous units, including the Willow Creek, St. Marys River, Ravenscrag and Paskapoo formations.

Marum Resources Inc. reported that it has been searching for sediment-hosted uranium deposits in Early Proterozoic Belt Supergroup rocks in the Clark Range (where prior work in the 1960s and 1970s identified occurrences with grab samples grading up to 4.8 lb U_3O_8 per ton, or 0.24% U_3O_8) or associated with Cretaceous Crowsnest volcanic formation rocks, and for "roll-front"-type uranium deposits in Late Cretaceous sedimentary clastic strata in the southwestern foothills and plains. In June 2005, Marum reported two samples with elevated amounts of carbonaceous material containing high amounts of uranium (5700 ppm and 4990 ppm). These results are equivalent to 0.57% uranium (0.58% U_3O_8) and 0.49% uranium (0.68% U_3O_8). In December 2005, Marum drilled 20 diamond drillholes averaging 100 m to test favourable stratigraphic targets in the vicinity of anomalous uraniferous locales south of Fort Macleod. Results of the drilling program have not yet been reported.

Firestone Ventures Inc. has also been active in 2005 and reported in May that it had discovered two anomalously radioactive "zones." Its reported results include Zone 1, which is in the central part of the Alberta Sun claim block centred on the Waterton River. At Zone 1, it reported that strongly hematite-stained sandstone, carbonaceous material and green shale occur throughout the Willow Creek formation section. Composite grab samples of isolated organic debris material returned 5630 ppm (0.664% U_3O_8), 6830 ppm (0.805% U_3O_8) and 7640 ppm (0.901% U_3O_8) uranium. These three samples also returned above-background levels of vanadium, arsenic, selenium, molybdenum and lead. At Zone 2, which is 40 km southeast of Zone 1 in the southern part of the Alberta Sun claim block centred near the town of Kimball, three rock samples were collected from radioactive material in a float boulder and from outcrop. A grey sandstone boulder that produced 1250-cps radioactivity returned 150 ppm (0.018 % U_3O_8) uranium, 57 ppm vanadium and 22 ppm lead. A grab sample of carbonaceous mudstone from outcrop returned 57 ppm uranium, 52 ppm vanadium and 48 ppm molybdenum. A second grab sample of strongly altered limonitic and carbonaceous

mudstone from outcrop returned 92 ppm uranium, 117 ppm vanadium, 31 ppm molybdenum and 53 ppm chromium. Firestone planned a follow-up program in early June, but its exploration crews were severely hampered by the inclement rainy weather and flooding during that period. In November, Firestone announced a drilling program to test for roll-front uranium deposits on the company's Alberta Sun and Redrock uranium exploration projects southwest of Lethbridge. Firestone has not yet announced any exploration results.

North American Gem (NAG) reported exploration on its 200 000-acre Del Bonita property, which is near the Canada-United States border due south of Lethbridge. In September, NAG announced the commencement of a geochemical exploration program to sample domestic water sources for radon gas, uranium and other ions on that property. There have been no results reported.

To the west of the Del Bonita property, International Ranger Corp. completed in July an initial field reconnaissance program on the Whiskey Gap property in southern Alberta, with samples sent to the Saskatchewan Research Council for analysis. In October, International Ranger announced that it had entered into a joint-venture agreement with North American Gem for exploration of the 44 400-acre Whiskey Gap uranium property. International Ranger reported that its preliminary sampling of domestic water sources defined several very strong radon and uranium anomalies in the water. It concluded that these results compare favourably with published radon studies conducted in proximity to sandstone-hosted uranium orebodies in south Texas and that the results are a positive indication of the potential for uranium mineralization in a sandstone host. In December, International Ranger provided the results from seven holes it had drilled at its Whiskey Gap property. In summary, the hole depths ranged from 100 m to a maximum of 149.4 m and contained reported "radioactive zones" that had maximum gamma ray radioactivity ranging from 175 API (American Petroleum Institute) units across 1.0 m up to 782 API units across 5.0 m.

Solitaire Minerals Corp. signed a letter of intent in October with Sandswamp Exploration Ltd. to purchase a 100% interest in four metallic and industrial mineral permits, collectively referred to as the Ravenscrag uranium property, totaling approximately 88 000 acres. These four permits were staked to target five continentally derived sedimentary formations, which include the Tertiary aged Cypress Hills and Ravenscrag sandstone formations and the Upper Cretaceous Whitemud and Eastend sandstone formations, in addition to channel sands within the Bearpaw shale formation. All of these formations are very similar in age and material composition to the southwestern Alberta Willow Creek, St. Mary River, and Blood Reserve formations already being explored by other uranium exploration companies in southern Alberta.

A number of other companies and individuals, including Strathmore Minerals, have also acquired mineral properties for uranium exploration in southern Alberta. No exploration results have been reported.

Precious, Base and Ferrous Metals

Reports indicate there was little exploration for precious or base metals within Alberta during 2005. However, an interesting M.Sc. thesis supported by the AGS was completed at the University of Alberta by Kelli Fraser. Fraser studied the Cenomanian-Turonian Second White Specks formation to evaluate the unit's "Sedex" base- and precious-metals potential and she reported that some maximum geochemical concentrations for this unit comprise 1331 parts per billion (ppb) silver, 140 ppm copper, 169 ppm molybdenum, 290 ppm nickel, 469 ppm zinc, 22.1% sulphur and 10.8% organic carbon. Fraser concluded that "some locations are enriched enough in organic carbon and metals to be geochemically classified as a metalliferous black shale."

In 2005, ferrous minerals were again of exploration interest in Alberta, including work by Micrex Development Corp. at its Burmis magnetite deposit near Crowsnest Pass, and Clear Hills Iron Ltd. on sediment-hosted ooidal ironstone within the Bad Heart formation in the Clear Hills, northwest of Peace River.

With respect to 2005 work on the Burmis paleoplacer magnetite deposits in late Cretaceous basal sandstones of the Belly River formation, Micrex Development Ltd. stated in a July 2005 press release that its field crews had recently completed a four-year study of the Burmis area in southwestern Alberta that included evaluation of environmental issues related to land, air and water quality, and wildlife in the Burmis area. The intent of this work is to permit Micrex to prepare a revised mine permit application. In October, Micrex announced that collection of data for environmental studies related to the Burmis magnetite deposit had been completed and that documentation required to support the mining application was now being prepared. The company hopes to start production of magnetite sometime in the near future with its product intended primarily for use in coal beneficiation in southeastern British Columbia.

In northwestern Alberta, prior work by both industry and the AGS suggested there was a potential iron "resource" of over 1 billion tonnes at a grade of about 35% iron in one or more ferroan ooidal ironstone deposits within the Late Cretaceous Bad Heart formation. In 2004, two companies, Clear Hills Iron Ltd. and Peace River Energy Ltd., both of which are Canadian subsidiaries of a U.S. company, Goldspring Inc., were active in the Clear Hills region. However, during the winter of 2004/05, there was management and corporate re-structuring at Goldspring Inc. and, apparently as a result, there was essentially no significant field exploration by its Canadian subsidiaries in the Clear Hills region during 2005. Most recently, Goldspring Inc. stated that it is also considering joint-venture opportunities for the development of its mineral and coal properties in the Clear Hills.

Partly in response to a relative lack of exploration activity in the Clear Hills region, the AGS initiated a multi-year project in 2004 to provide data and information to stimulate both iron and coal resources exploration and development in this region. This project continued in the summer and early fall of 2005 with selected fieldwork, including mechanical trenching of selected outcrops and geochemical sampling. Preliminary reports have been prepared or are in preparation.

Industrial Minerals

Building Stone

One of the two producers of Rundlestone (Thunderstone Quarries) is under new management. The highly recognizable Alberta building stone known as "Rundle Rock" or "Rundlestone" is produced at only two quarries, both in the Bow Valley but on opposite sides of the valley. Kamenka Quarry Ltd. is located near Harvie Heights and Thunderstone Quarries produces from a quarry near Dead Man Flats. Rundle Rock is a flaggy, fine-grained sandstone/siltstone from the Triassic Spray River group and is best known as the rock that was used to build the world-famous Banff Springs Hotel in Banff, Alberta.

Mineral Aggregate

In a December 23, 2005, news release, Birch Mountain Resources Ltd. of Calgary reported the opening of its Muskeg Valley quarry and the quarrying of 800 000 m^3 of crushed stone aggregate. The quarry is located north of Fort McMurray. Materials are being sold through its marketing joint venture, Hammerstone Products Ltd. Birch Mountain has extensive mineral holdings in the oil sands region of northeastern Alberta. In addition to construction aggregates, Birch Mountain is testing limestone for use as quicklime in applications such as flue gas desulphurization, water treatment, pulp and paper manufacturing, and soil stabilization.

2.10 BRITISH COLUMBIA[21]

Summary and Outlook

Exploration spending in British Columbia has been accelerating since 2001. The forecast total expenditure for 2005 is $220 million. This level of spending has not been seen for 15 years, since the previous era of government-sponsored flow-through-share financing in 1990.

This magnitude of spending bodes well for the expansion of British Columbia's mineral economy and has financed more than 600 active exploration projects in 2005. Equally impressive, and at advanced stages of exploration, are the 30 proposed new mine developments that were either in or through the mine-permitting process (**Table 18**).

Table 16 shows the strong growth in exploration spending over the last four years. This equates to a 65% annual compound growth rate during this expansionary period. The key drivers of this exceptional growth in exploration spending were threefold. First, demand from China and the world in general drew down immediate supplies of several mineral commodities, particularly molybdenum, copper and metallurgical (met) coal. Loss of these supplies drove the demand for new supplies and commodity prices up. Second, the potential for new ore discoveries in British Columbia's mineral-abundant Cordilleran Terrane is well documented. Third, the provincial government is steadily building its reputation for supporting mineral exploration and mine development through tax cuts, regulatory improvements, and improved geoscience.

While high commodity prices boosted exploration spending in most of the world's mining jurisdictions, it is notable that British Columbia has even moved ahead of this trend as its share of Canada's spending increased steadily from 6% in 2001 to an estimated 16% in 2005, as shown in **Figure 28**. To some extent, this growing share of spending is attributed to the provincial government's increasingly friendly and internationally competitive regulatory environment. Of further interest, only British Columbia and three other western jurisdictions, namely the Northwest Territories, Saskatchewan and Manitoba, increased their share of Canada's total spending in 2005. Compared with these other western regions, British Columbia holds a competitive advantage from its greater diversity of mineral commodities, both explored for and mined, and its strategically located Pacific Rim port facilities, which provide access to over half the world's population.

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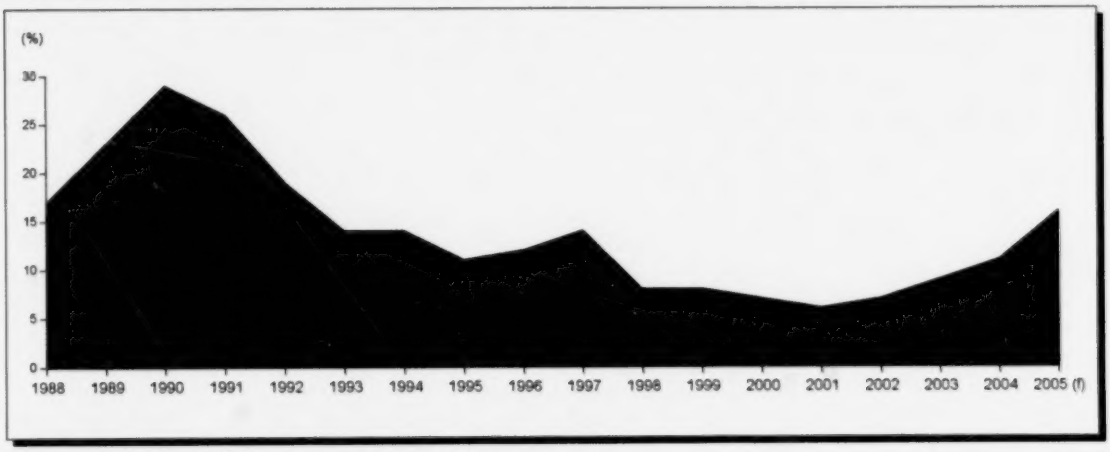
[21] The British Columbia review of activities was prepared by Jim Lewis. For more information, the reader is invited to contact Mr. Lewis by telephone at (250) 952-0521 or by e-mail at jim.lewis@gov.bc.ca.

TABLE 16. EXPLORATION EXPENDITURES IN BRITISH COLUMBIA, 1997-2005

	1997	1998	1999	2000	2001	2002	2003	2004	2005 (f)
Spending ($ millions)	115	55	41	36	29	39	63	130 (1)	220 (1)
Percent change (%)	..	-53	-24	-13	-19	+35	+59	+106	+69

Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.
.. Not available; (f) Forecast of intentions.
(1) Based on British Columbia's Ministry of Energy, Mines and Petroleum Resources survey of exploration which, by memorandum of understanding with Natural Resources Canada, is temporarily used as early estimates.
Notes: All figures include exploration and deposit appraisal (and exclude mine complex development). In addition to field work and overhead expenditures, statistics include engineering, economic and feasibility studies, environmental and land access spending. All statistics (except 2004 and 2005 - see footnote 1) are referenced from the official federal-provincial/territorial Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures. The official statistics from this survey are the source for Statistics Canada's National Accounts.

Figure 28
British Columbia's Exploration Expenditures as a Percentage of Canada's Total Expenditures, 1988-2005



Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.
(f) Forecast of intentions.

British Columbia's strong level of exploration spending is expected to continue in 2006. Commodity prices are projected to maintain current high levels as copper and met coal supplies remain tight. Many flow-through financings are complete and available for funding further exploration work, and the provincial government is working on implementing further pro-development exploration and mining initiatives.

Government Initiatives

During 2005, the provincial government continued developing and implementing supportive initiatives to stimulate growth in exploration and mining in British Columbia. The following points list some of the actions completed:

- Published the *British Columbia Mining Plan* in January 2005. The plan presents the vision of a healthy, sustainable mining sector for the next decade and beyond. The plan includes 14 broad strategies and over 50 actions to support the following four cornerstones:

  - Enhance global competitiveness, including actions to increase investment and further develop relevant skills and technologies;
  - Ensure access to land, including more efficient integration of exploration and mining with other land uses;
  - Focus on communities and First Nations, including community forums to discuss current and future exploration and mining activities and regional opportunities; and
  - Protecting workers and the environment, including building on world-class worker safety and environmental sustainability.

- Provided a 10-year extension of the Mining Exploration Tax Credit, which is a 20% refundable tax credit to companies undertaking eligible grass-roots mineral exploration in British Columbia. This positions British Columbia amongst the top rank of Canadian jurisdictions offering exploration tax incentives.

- Implemented Mineral Titles Online in January 2005. This system enables clients to secure mineral claims through Internet map selection and eliminates the physical effort and costs involved in claim staking. This acclaimed innovative system received a national mining award from the Prospectors and Developers Association of Canada.

- Expanded geoscience-based knowledge for the province by completing:
  - Geoscience surveys in the Canim Lake, Eskay Creek, Port McNeil, Terrace and Toodoggone areas;
  - Economic geology studies on porphyry copper deposits, coal, diamonds and industrial minerals;
  - The release of regional geochemical survey data for the Bowser River and Spatsizi areas; and
  - Further expansions and upgrading to geoscience databases available to the public through www.em.gov.bc.ca/geology. Databases include MapPlace, MINFILE, CoalFile and Assessment Reports.

- Contributed $25 million to establish Geoscience B.C., a centre for geoscience. Geoscience B.C. is now established in Vancouver as a non-profit centre, working with partners and contractors to produce public geoscience information to attract further investment to British Columbia.

- Appointed a new Minister of State for Mining who can focus directly on the unique needs of the exploration and mining industries as an important adjunct to the Minister of Energy and Mines.

- Set out new, clear emission standards for coal-fired power generation to give industry certainty around government expectations. This opens up possibilities for coal exploration oriented to mine-mouth power plant potential.

- Appointed a provincial coal director to work with First Nations and industry to facilitate the development of new coal projects.

- Initiated work on supporting infrastructure. For example, the provincial government is promoting the continued use of Ridley as a coal-exporting terminal and has developed a ports strategy to support access to ports and railways. This entails collaboration with the federal government and rail and port authorities to ensure that British Columbia remains the Pacific gateway for mineral exports.

- Enhanced the knowledge of both benefits and potential regional opportunities by conducting several First Nations and other community forums focused on economic development through exploration and mining.

- Promoted the future development of and national-international investment in exploration and mining in British Columbia through trade conferences in Vancouver and Toronto, and provincial government meetings with international trade delegations.

Statistical Trends In British Columbia's Exploration Sector

It is estimated that British Columbia accounts for 2.5% of the world's total exploration spending (i.e., based on the Metals Economics Group's 2005 survey showing that Canada accounts for 19% of the world's exploration budgets and Natural Resources Canada's mid-year survey estimating British Columbia's share of Canada's spending at 14%). Part of British Columbia's ability to become a significant exploration jurisdiction on the world stage is attributed to its large number of resident junior mining companies. Not only are these companies very adept at raising exploration funds and conceiving and managing exploration projects in the world at large, but they also, as resident companies of British Columbia, have a desire to work on successful exploration and mine development projects within the province. As major financiers, the British Columbia mining sector raised 39% ($2.2 billion) of the total $5.7 billion mine equity capital raised by the TSX and TSX-Venture exchanges to the end of October 2005. (The $5.7 billion figure probably represents over 80% of the world's required exploration capital in 2005.)

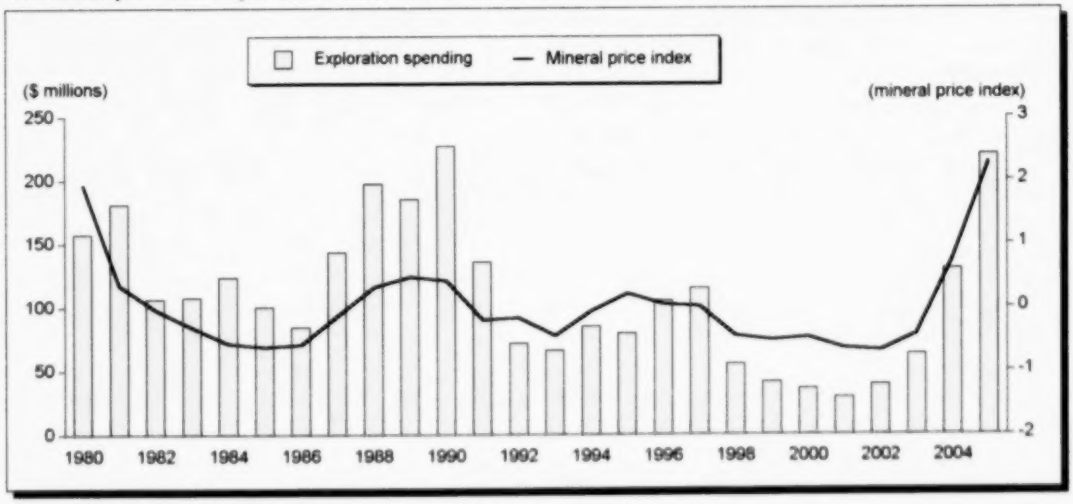
The graphs that follow highlight current trends in British Columbia's exploration activities. Amongst other factors, British Columbia's industry-friendly government and, in particular, mineral commodity price levels, are key drivers of exploration spending. **Figure 29** verifies this relationship and shows the high correlation between British Columbia's exploration spending and the British Columbia mineral price index, which comprises main minerals explored for and mined in the province (i.e., met coal, copper, molybdenum, gold, silver, zinc and lead prices). This figure also shows the rapid acceleration of price levels and exploration spending over the last four years.

This rapid acceleration in price levels is detailed by individual mineral commodity in **Figure 30** (where prices are indexed at 100 in 1999) and **Table 17**. Molybdenum's price increase ranks highest, followed by met coal, then copper, gold and zinc. Even zinc has increased its price by a substantial 39% over the last four years. This ranking explains why molybdenum and coal exploration and development projects have rapidly moved to the fore in British Columbia.

In **Figure 31**, three key indicators of exploration activity are plotted along with exploration spending. Each is indexed at a value of 100 in 1999. Interestingly, increases in claim staking and free miner certificates (i.e., permits for individuals and companies to explore) lag mineral price increases by one to two years. Generally, increases in all three indicators coincide with the increases in exploration spending. Claim staking's phenomenal increase in 2005 is not only due to the high interest in exploration, but is also the result of the high benefit-to-cost for prospectors and industry as they changed from field to on-line staking through the government's new Mineral Titles Online system. Notices of work issued are a less responsive indicator since they are issued for work over multiple years.

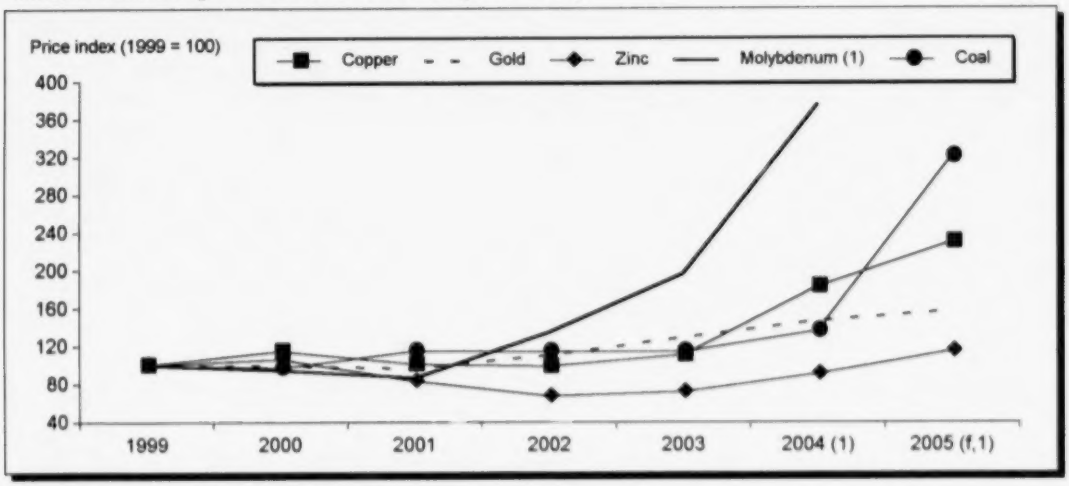
Other key exploration trends and impacts are highlighted in the next four figures. As observed in **Figure 32**, the jump in the magnitude of spending on porphyry and coal deposits in 2005 is consistent with the "step-function" price increases in copper and molybdenum (found in porphyry deposits) and met coal. Also illustrated is the current 2005 situation where the high interest in these two deposit types has diverted proportionate exploration spending away from veins and massive sulphide deposits. Another trend worth noting is the increased spending in industrial minerals, which include construction aggregates. Demand for aggregates in 2005 has been robust in the bigger cities,

Figure 29
Annual Exploration Expenditures and British Columbia's Mineral Price Index, 1980-2005



Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.
Note: Exploration expenditures for 2005 are based on a revised forecast of intentions.

Figure 30
Mineral Commodity Price Levels, 1999-2005 (1999 = 100)



Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.
(f) Forecast.
(1) The index value for molybdenum is 601 in 2004 and 1189 in 2005.

driven by construction needs for both large new residential complexes and non-residential development projects. An additional boost for aggregate supplies is coming from projects supporting the 2010 Olympics.

Figure 33 shows a big jump in exploration spending over the last two years relative to deposit appraisal and mine complex development. This is expected in the early stages of the exploration cycle; however, once more and more projects advance to the pre-feasibility stage, the deposit appraisal component is expected to increase.

TABLE 17. INCREASES IN THE PRICE OF SELECTED MINERAL COMMODITIES, 2001-05

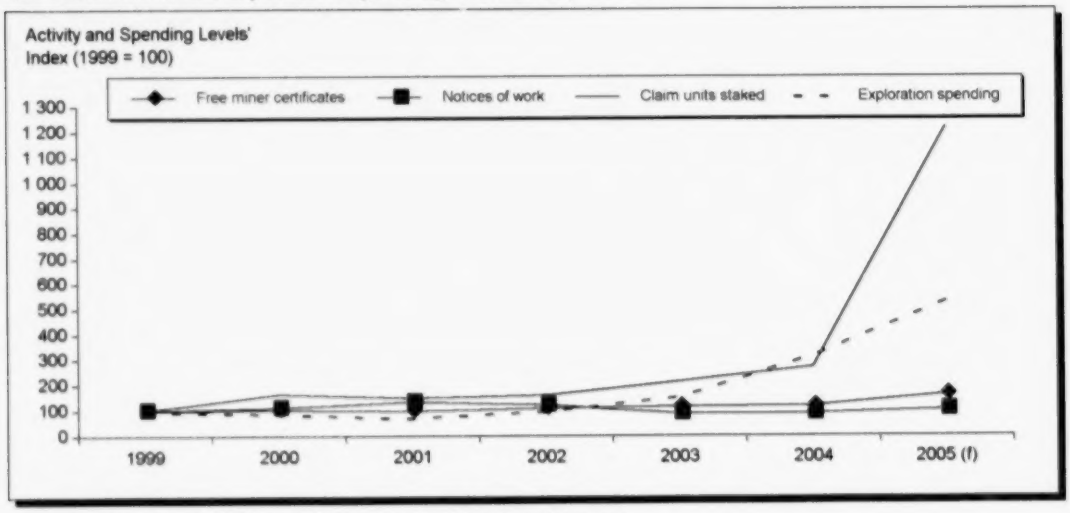
Mineral Commodity	Price Increase
	(%)
Molybdenum	1 265
Copper	126
Gold	61
Coal	39
Zinc	177

Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.
Note: The price of molybdenum is based on the price of MoS_2.

Similarly, **Figure 34** shows both the rapid increase in exploration over the past two years and the rapid increase in the proportion of spending by junior companies. Again, this is consistent with the early stages of the exploration cycle and the adage that, "juniors find the deposits and seniors develop and operate them." The large increase in junior company spending should increase the chances for making a world-class discovery in British Columbia and subsequently attracting more senior mining company activity in the province.

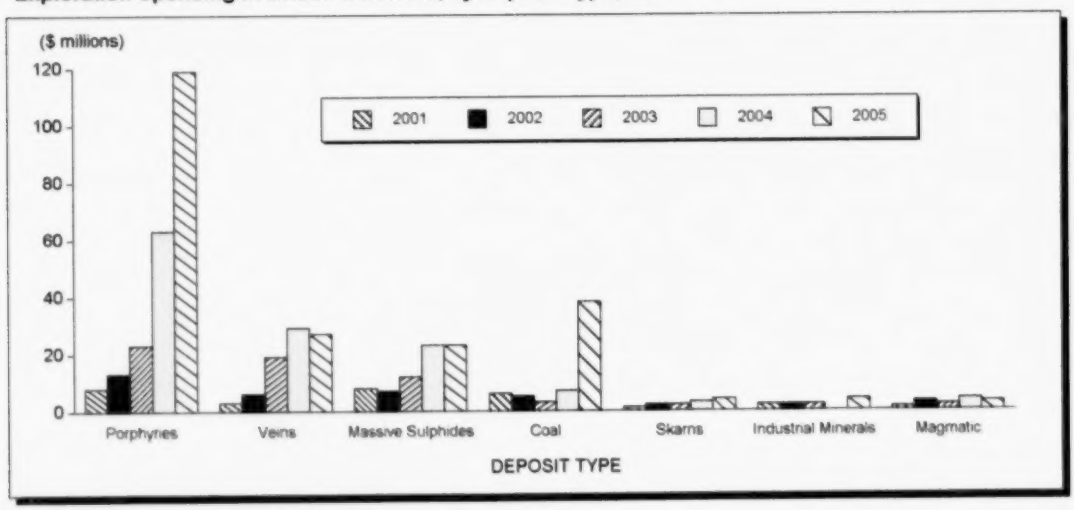
Figure 35 compares the number of active exploration companies with their average expenditures. As exploration spending has increased, so has the number of companies. As mineral commodity prices jumped substantially in 2004 and again in 2005, the spending per company made corresponding jumps. This is partly explained by an increase in the more expensive deposit appraisal work associated with advanced-stage projects. In the high mineral price environment, many companies focused on projects with known deposit inventories, which hold strong potential for them to open mines and move product to market as quickly as possible.

Figure 31
Exploration Activity in British Columbia as Indicated by Free Miner Certificates, Claim Units, Notices of Work and Exploration Spending, 1999-2005 (1999=100)



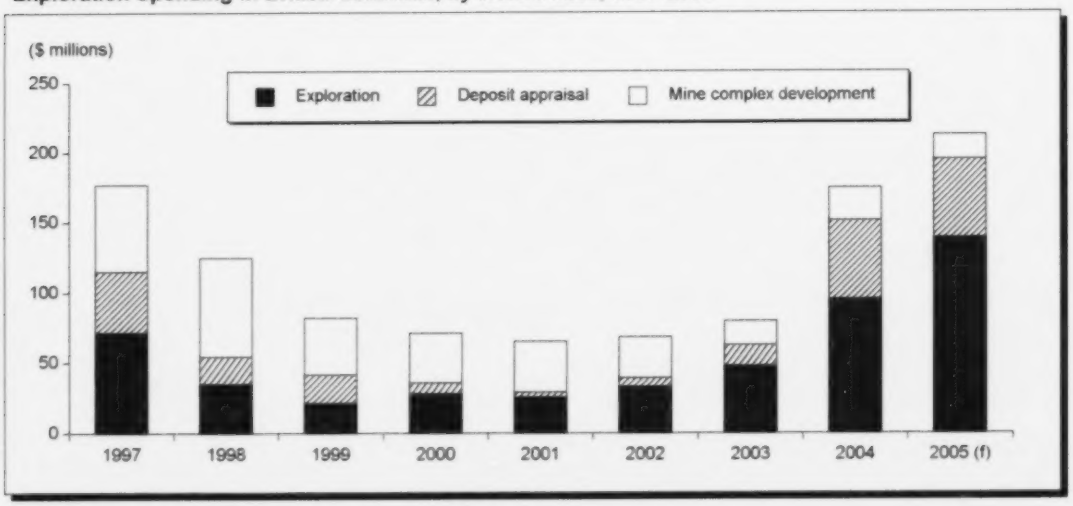
Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.
(f) Forecast.
Note: Exploration spending in 2005 is based on a revised forecast of intentions.

Figure 32
Exploration Spending in British Columbia, by Deposit Type, 2001-05



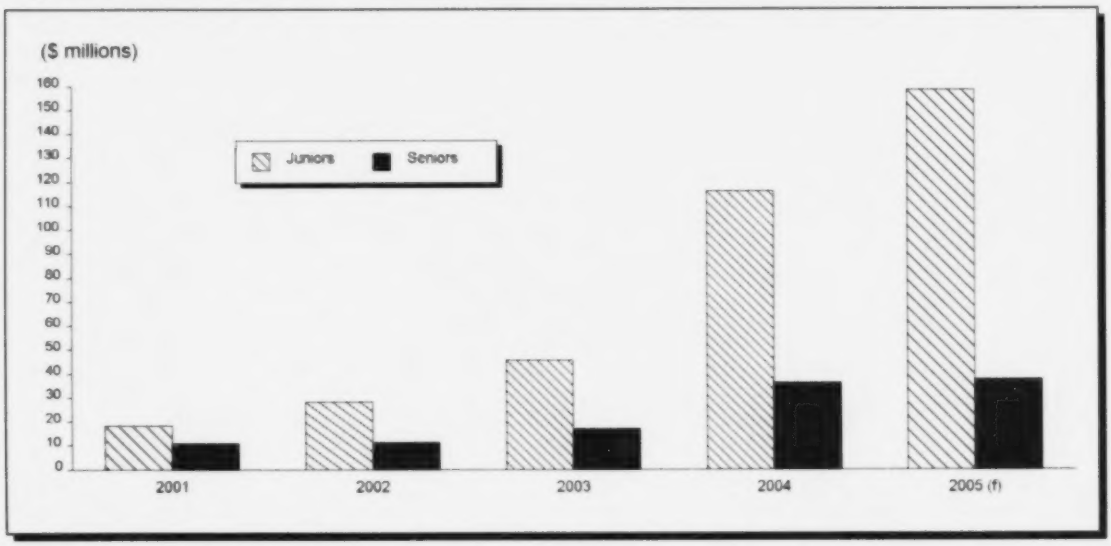
Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.

Figure 33
Exploration Spending in British Columbia, by Work Phase, 1997-2005



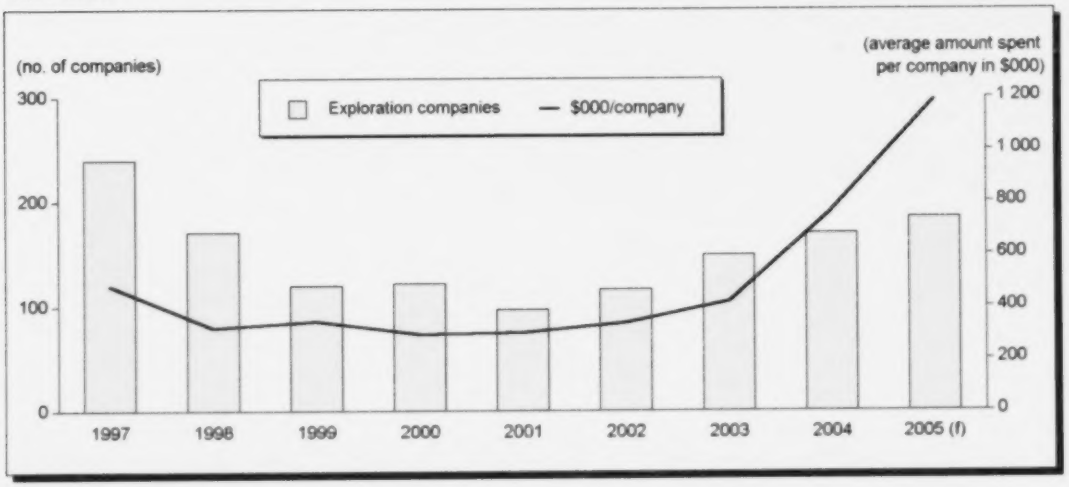
Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.
(f) Forecast.

Figure 34
Exploration Spending in British Columbia, by Junior and Senior Companies, 2001-05



Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.
(f) Forecast.

Figure 35
Number of Exploration Companies and Average Amount Spent Per Company, in British Columbia, 1997-2005



Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.
(f) Forecast.

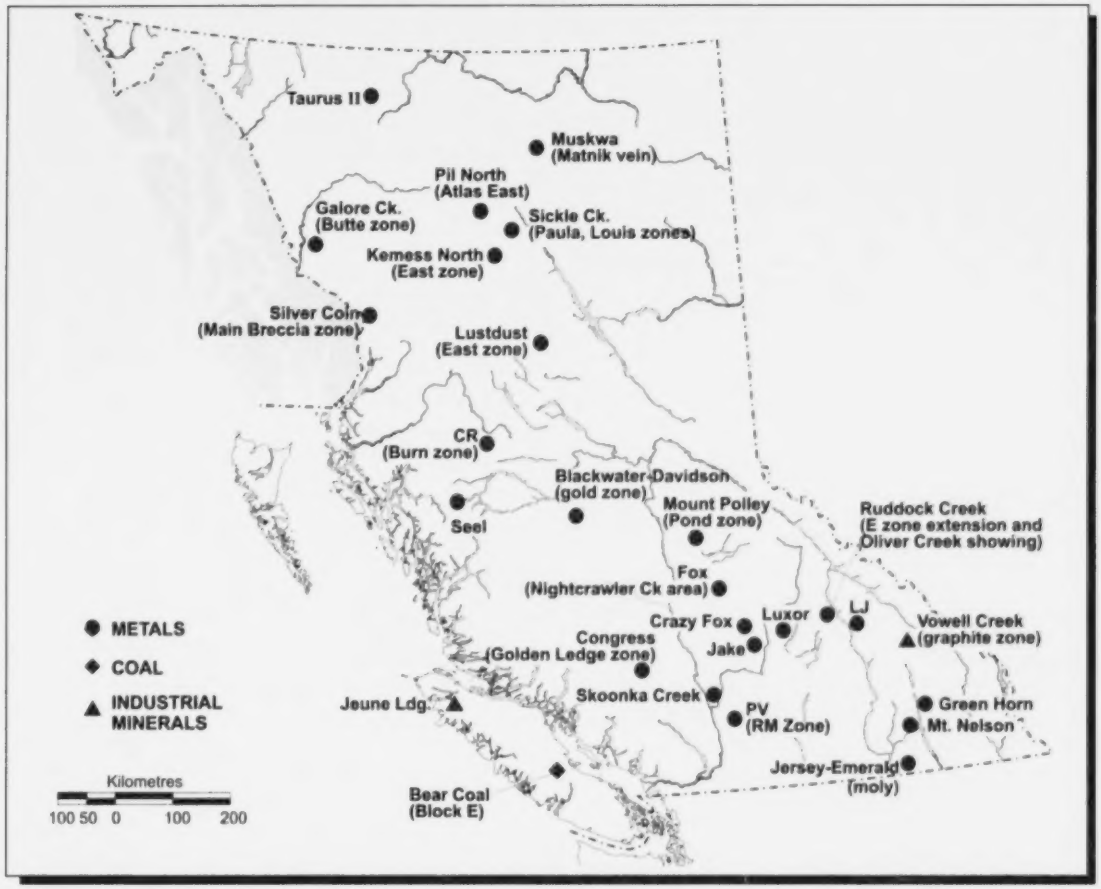
Exploration Highlights

The big jump in exploration spending over the last two years has greatly intensified the in-depth examination of mineral occurrences and known deposits in British Columbia. With spending having only recently exceeded $100 million in 2004 and $200 million in 2005, on the one hand the province is in the early stages of a new exploration cycle. The hope is that this strong cycle will continue, that even more discoveries will be made (e.g., as in **Figure 36**), and that many of today's early exploration-stage projects will develop into mines. On the other hand, rapid increases in met coal, molybdenum and copper prices have allocated large amounts of spending to known coal and porphyry (i.e., molybdenum and copper ore) deposits where companies are targeting more immediate mine operations.

In general, the profile of exploration spending in 2005 is widespread in terms of project types and the diversity of minerals sought. Of the 600-plus exploration projects in 2005, spending in over 40 projects exceeded $1 million and in over 200 projects exceeded $100 000. The hope is that this exploration leads to providing the province with a good inventory of mine development options. The magnitude and distribution of this spending incorporates a healthy balance of diversified projects ranging from grass-roots to near-development-stage opportunities.

Table 18 lists over 80 projects that are in advanced stages of exploration and categorizes them in the following four groups: 1- recent mine openings, 2 - proposed mine developments, 3 - pre-feasibility projects, and 4 - projects attracting large expenditures with pre-feasibility potential. Project locations are shown on the map in **Figure 37**. Worth noting is the fact that, in this current period of high copper, molybdenum and met coal prices, all but 5 of the 33 new mines and proposed mine developments (see sections 1 and 2 of **Table 18**) are focused on exploring for these three minerals. Additionally, the 81 advanced-stage projects listed in the table comprise an interesting "shopping list" for possible mine financing and development by multi-national senior mining companies. For detailed descriptions of the projects listed in **Table 18** and many of the other projects explored in 2005, see the British Columbia Ministry's publication, *British Columbia Mineral Exploration Review – 2005*, also found on the ministry web site at www.em.gov.bc.ca/Mining/Geolsurv/Publications/catalog/catexrev.htm.

Figure 36
New Mineral Discoveries in British Columbia, 2005



Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.

Exploration efforts were rewarded with new discoveries in 2005. **Figure 36** highlights 24 of the more significant discoveries.

On a slightly different track, the concept of focusing more effort on finding "economic-grade ore at depth" is in formative stages of discussion, both provincially and nationally. With the possible exception of LeRoi and Bralorne, few mines in British Columbia have drawn ore from deep deposits. Several provincial examples support the idea of potential benefits coming out of this ore-at-depth discussion. In 2005, deep drilling confirmed the continuity of copper-gold mineralization below the existing pit at Abacus Mining's Ajax project. At Mount Polley, Imperial Metals Corporation also confirmed the existence of higher-grade mineralization at depth by drilling below previously mined and identified mineral zones. Other "deep" mineralized projects might include Kemess North, Galore Creek, Tulsequah Chief, New Polaris, New Afton, Spanish Mountain, Ruddock Creek, and Sullivan Deeps. In the geologically complex orogenesis and highly mobilized, high-compression plate tectonic Cordilleran environment, exploration projects targeting economic-grade ore at depth are beginning to show some positive results.

The momentum of the successes resulting from $220 million spent on exploration in 2005 and the completion of recent exploration capital fundings suggest that British Columbia will see a strong

TABLE 18. MINE DEVELOPMENT PROJECTS, NEW MINES AND ADVANCED-PHASE EXPLORATION PROJECTS IN BRITISH COLUMBIA, 2005

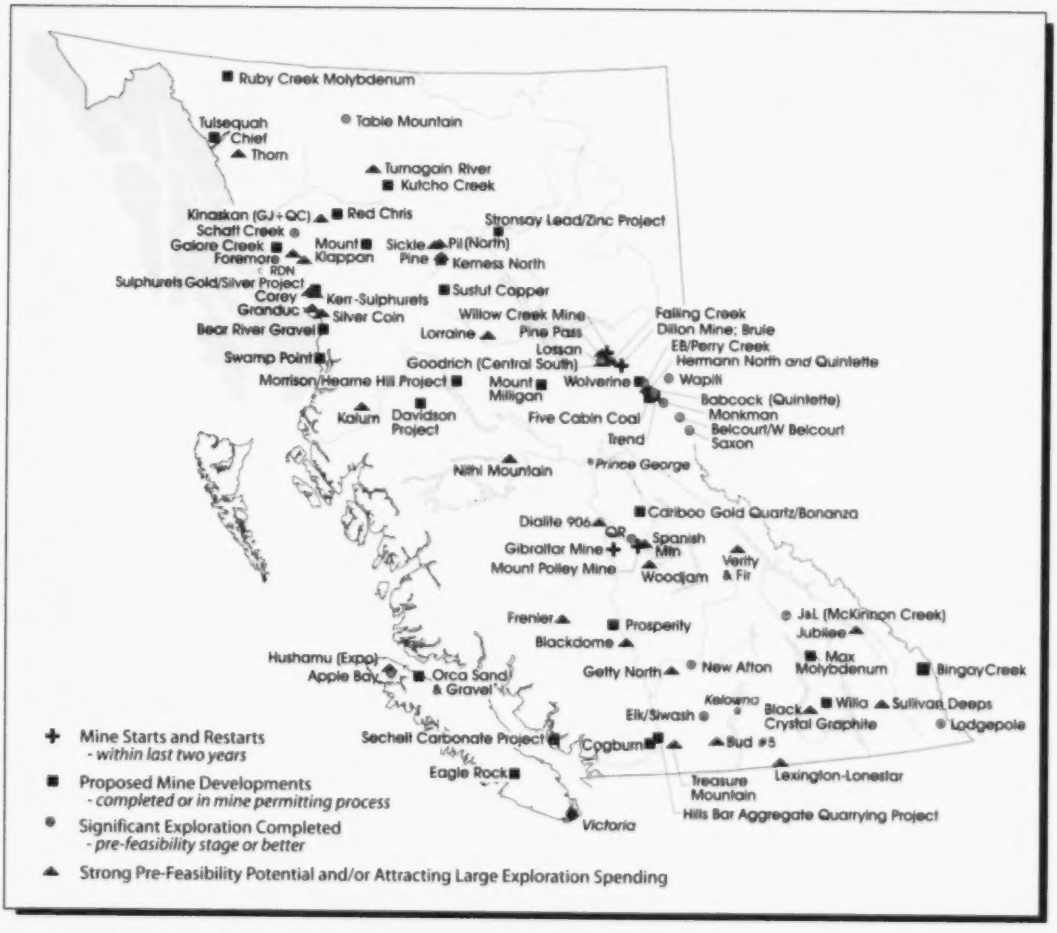
Sector	Exploration Project/Operation	Company/Operator	Commodity	Deposit Setting
MINE STARTS AND RE-STARTS (WITHIN LAST TWO YEARS)				
Coal	Dillon	Western Canadian Coal Corp.	Coal-PCI	Coal
Metal	Gibraltar	Taseko Mines Ltd.	Cu, Mo	Porphyry
Metal	Mount Polley	Imperial Metals Corporation	Au, Cu	Porphyry
Coal	Willow Creek	Pine Valley Mining Corporation	Coal-PCI	Coal
PROPOSED MINE DEVELOPMENTS - COMPLETED OR IN MINE-PERMITTING PROCESS				
Aggregate	Bear River Gravel	Beacon Ventures Inc.	Aggregate	Aggregate
Coal	Bingay Creek	Hillsborough Res. Ltd.	Coal-met	Coal
Coal	Brule	Western Canadian Coal Corporation	Coal	Coal
Metal	Cariboo Gold Quartz/Bonanza	International Wayside Gold Mines Ltd.	Au	Vein-mesothermal
Metal	Cogburn	Leader Mining International Inc.	Magnesium, PGE	Magmatic-PGE
Metal	Davidson	Blue Pearl Mining Ltd.	Molybdenum	Porphyry
Aggregate	Eagle Rock	Eagle Rock Materials Ltd.	Crushed rock	Construction aggregate
Coal	Five Cabin Coal	Hillsborough Resources Limited	Coal	Coal
Metal	Galore Creek	NovaGold Resources Inc.	Cu, Au, Ag	Porphyry
Aggregate	Hills Bar Aggregate	Qualark Resources	Crushed rock, Au	Construction aggregate
Metal	Kemess North	Northgate Minerals Corp.	Cu, Au	Porphyry
Metal	Kutcho Creek	Western Keltic Mines Inc.	Cu, Zn, Ag, Au	Volcanogenic massive sulphide
Metal	Max Molybdenum	Rocca Minerals Inc.	Molybdenum	Porphyry
Metal	Morrison/Hearne Hill	Pacific Booker Minerals Inc.	Cu, Au	Porphyry
Coal	Mount Klappan	Fortune Minerals Limited	Coal-anthracite	Coal
Metal	Mount Milligan	Placer Dome Inc.	Cu, Au	Porphyry
Aggregate	Orca Sand and Gravel	Polaris Minerals Corp.	Sand & gravel	Construction aggregate
Metal	Prosperity	Taseko Mines Ltd.	Cu, Au	Porphyry
Metal	Red Chris	bcMetals Corp.	Cu, Au	Porphyry
Metal	Ruby Creek Molybdenum	Adanac Moly Corp.	Molybdenum	Porphyry
IM	Sechelt Carbonate	Pan Pacific Aggregates Ltd.	Limestone/dolomite	Carbonate rock
Metal	Stronsay Lead/Zinc	Cirque Operating Corporation	Zn, Pb, Ag	Sedimentary exhalative
Metal	Sulphurets Gold/Silver	Newhawk Gold Mines Ltd.	Gold, silver	Porphyry
Metal	Sustut Copper	Northgate Minerals Corp.	Cu, Ag	Redbed
Aggregate	Swamp Point	Ascot Resources	Sand & gravel	Construction aggregate
Coal	Trend	NEMI Northern Energy and Mining Inc.	Coal-met	Coal
Metal	Tulsequah Chief	Redfern Resources Ltd.	Cu, Au, Zn, Ag, Pb	Volcanogenic massive sulphide
Metal	Willa	Bethlehem Resources Corp.	Cu, Au	Porphyry
Coal	Wolverine Coal	Western Canadian Coal Corp.	Coal	Coal
SIGNIFICANT EXPLORATION COMPLETED - PRE-FEASIBILITY STAGE OR BETTER				
Metal	New Afton	New Gold Inc.	Cu, Au	Porphyry
IM	Apple Bay	Electra Gold Ltd.	Silica, kaolin	Industrial mineral
Coal	Babcock	Elk Valley	Coal-met	Coal
Coal	Belcourt/West Belcourt	Western Canadian Coal Corporation	Coal-PCI	Coal
Coal	EB/Perry Creek	Western Canadian Coal Corporation	Coal	Coal
Metal	Elk/Swash	Almaden Minerals Ltd.	Au	Vein-mesothermal
Metal	J & L (McKinnon Creek)	BacTech Mining Corp.	Au, Ag, Cu, Zn, Pb	Sedimentary exhalative
Coal	Lodgepole	Cline Mining	Coal	Coal
Coal	Lossan	Cline Mining	Coal	Coal
Coal	Monkman	Elk Valley	Coal-PCI	Coal
Metal	QR	Cross Lake Minerals Ltd.	Au	Skarn
Coal	Saxon	NEMI Northern Energy and Mining Inc.	Coal-PCI	Coal
Metal	Schaft Creek	Guy Salazar	Au, Ag, Cu, Mo	Porphyry
Coal	Sukunka	Talisman	Coal-PCI	Coal
Metal	Table Mountain	Cusac Gold Mines	Au	Vein-mesothermal
Coal	Wapiti	Aurora	Coal-thermal	Coal
STRONG PRE-FEASIBILITY POTENTIAL (AND/OR) ATTRACTING LARGE EXPLORATION SPENDING				
IM	Bee 1&2	Western Industrial Clay Products Ltd.	Zeolite	Industrial mineral
IM	Black Crystal Graphite	Crystal Graphite Corp.	Flake graphite	Industrial mineral
Metal	Blackdome	J-Pacific Gold Inc.	Au	Vein-epithermal
IM	Bud #5	Western Industrial Clay Products Ltd.	Bentonite, zeolite	Industrial mineral
Metal	Corey	Kennich-Eskay	Au, Ag, As, Cu	Volcanogenic massive sulphide
IM	Dialite 906	Dialite Industries Ltd.	Diatomite	Industrial mineral
Coal	Falling Creek	Kennecott	Coal	Coal
Metal	Foremore	Roca Mines	Zn, Pb, Ag, Ba	Volcanogenic massive sulphide
IM	Frenier	BBF Resources Inc.	Perlite	Industrial mineral
Metal	Getty North	Getty Copper Corp.	Cu	Porphyry
Coal	Goodrich (Central South)	First Coal Corp.	Coal	Coal
Metal	Granduc	Bell Resources	Cu, Ag, Au	Volcanogenic massive sulphide
Coal	Hermann North	Western Canadian Coal Corporation	Coal-PCI	Coal
Metal	Hushamu (Expo)	Lumina Resources Corp.	Cu, Au	Porphyry
IM	Jubilee Mtn.	Tiger Ridge Resources Ltd.	Barite	Industrial mineral
Metal	Kalum	Eagle Plains	Au, Ag	Vein-mesothermal
Metal	Kerr-Sulphurets	Noranda/Seabridge	Au, Ag	Porphyry
Metal	Kinaskan (GJ+QC)	Canadian Gold Hunter	Cu, Au	Porphyry
Metal	Lexington-Lonestar	Gold City Ind.	Au, Cu	Vein-mesothermal
Metal	Lorraine	Eastfield Resources Ltd.	Cu, Au, Ag	Porphyry
Metal	Nithi Mountain	Leeward Capital	Mo	Porphyry

TABLE 18 (cont'd)

Sector	Exploration Project/Operation	Company/Operator	Commodity	Deposit Setting
Metal	Pil (North)	Finlay Minerals	Cu, Au	Porphyry
Metal	Pine	Cascadero	Cu, Au	Porphyry
Coal	Pine Pass	Falls Mountain Coal	Coal	Coal
Coal	Quintette	EVCC	Coal	Coal
Metal	RDN	Northgate/Rimfire	Au, Ag	Volcanogenic massive sulphide
Metal	Sickle	Stealth Minerals	Au, Ag	Vein-epithermal
Metal	Silver Coin	Pinnacle/Mountain Boy	Au, Ag, Cu, Pb, Zn	Vein-mesothermal
Metal	Spanish Mtn.	Wildrose/Skygold	Au	Vein-mesothermal
Metal	Sullivan Deeps	Stikine Gold	Zn, Pb, Ag	Sedimentary exhalative
Metal	Thorn	Rimfire/Cangold	Cu, Au, Ag	Vein-epithermal
Metal	Treasure Mountain	Huldra Silver	Ag, Pb, Zn	Vein-mesothermal
Metal	Turnagain River	Hard Creek Nickel	Nickel	Magmatic-nickel
IM	Verity and Fir	Commerce Resources Corp.	Tantalum, niobium	Industrial mineral
Metal	Woodjam	Fjordland	Cu, Au	Porphyry

Source: British Columbia Ministry of Energy and Mines.
Ag Silver; Agg. Construction aggregates project; Au Gold; Ba Barium; Coal-met. Metallurgical coal; Coal-PCI Pulverized coal injection; Cu Copper; IM Industrial mineral; Mo Molybdenum; Pb Lead; PGE Platinum Group Elements; Zn Zinc.
Note: The project list was developed from publicly available data and from company contacts up to December 2005.

Figure 37
Advanced-Stage Exploration Projects and Recent Mine Development in British Columbia, 2005



Source: British Columbia Ministry of Energy, Mines and Petroleum Resources.

exploration program continuing in 2006. Coal, gold, open-pit copper, high-grade molybdenum and bonanza-type gold targets will continue to be a key focus of exploration throughout the province.

Conclusions and Future Outlook

British Columbia is strategically positioned to find and develop new mines, supply domestic markets and, more importantly, ship minerals efficiently to any customer in the Pacific Rim and elsewhere. The province has: (1) nearly 1 million km^2 of mineral-abundant terrain, (2) modern power, port, highway and rail infrastructure, (3) a mining sector that is highly adept at raising exploration capital, and (4) a government that supports exploration and mining development. These are only some of the key assets that support British Columbia's expectation for a highly sustainable and growth-oriented mineral economy.

Even under a downside scenario where China and the world economy slow, British Columbia's continued significant exploration and mining activity is reasonably assured. The province has a strong base of over 50 metal, coal, industrial mineral and large-scale aggregate mines and abundant potential for new mine developments (**Table 18**). The momentum from the results of 2005's 600 exploration projects, the in-place financing already committed to further exploration, and the continued tight world supplies of several mineral commodities support projections for another year of robust exploration in 2006.

2.11 YUKON[22]

2005 Overview

Mineral exploration expenditures have continued their dramatic rise for the third consecutive year with an estimated $50 million spent in 2005 exploring for a wide range of commodities. Expenditures in 2004 were $22 million (**Figure 38**). Approximately 70% of expenditures was spent on the exploration of base metals, 20% for precious metals, and the remainder on gemstones and coal. Claim staking remained at significant levels with 5716 claims staked (**Figure 39**), and claims in good standing have increased slightly over 2004 levels to 50 373 (**Figure 40**).

Mines and Mine Development

Three projects are currently approaching the production stage; these consist of Yukon Zinc Corporation's Wolverine (zinc-silver-lead-copper-gold), Sherwood Copper Corporation's Minto (copper-gold-silver) and Cash Minerals Ltd.'s Division Mountain (coal) deposits. All three projects conducted advanced exploration in support of feasibility studies that are expected to be released in the last quarter of 2005 and the first quarter of 2006. Two other projects, Western Silver Corporation's Carmacks Copper (copper-gold) and Tintina Mines Ltd.'s Red Mountain (molybdenum) deposits, are at the pre-feasibility stage.

Placer Mining Industry

Today, more than 100 years after the discovery of gold in the Yukon, placer mining is still an important sector in the Yukon's economy. Over 16.6 million crude oz (517 t) of placer gold have been produced to date in the Yukon; at today's prices, that would be worth more than $7 billion.

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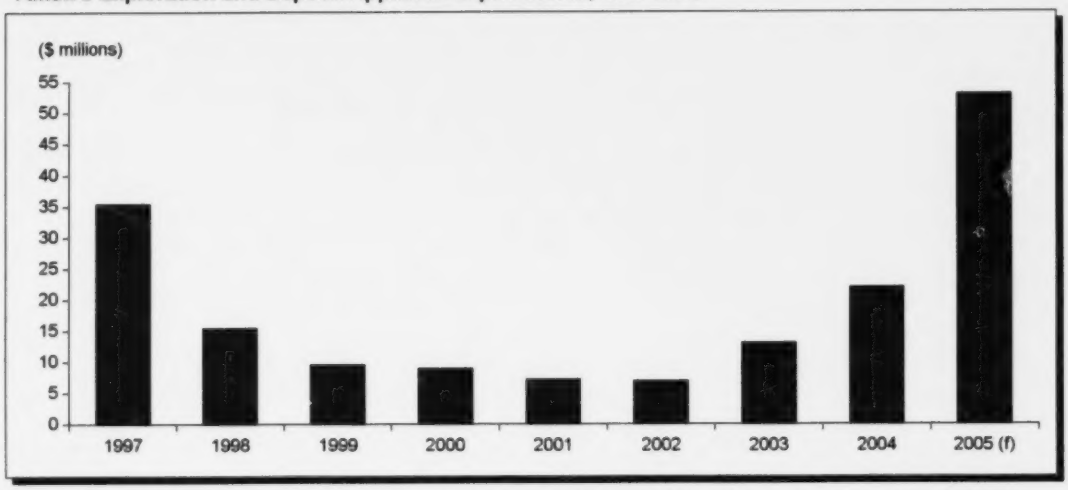
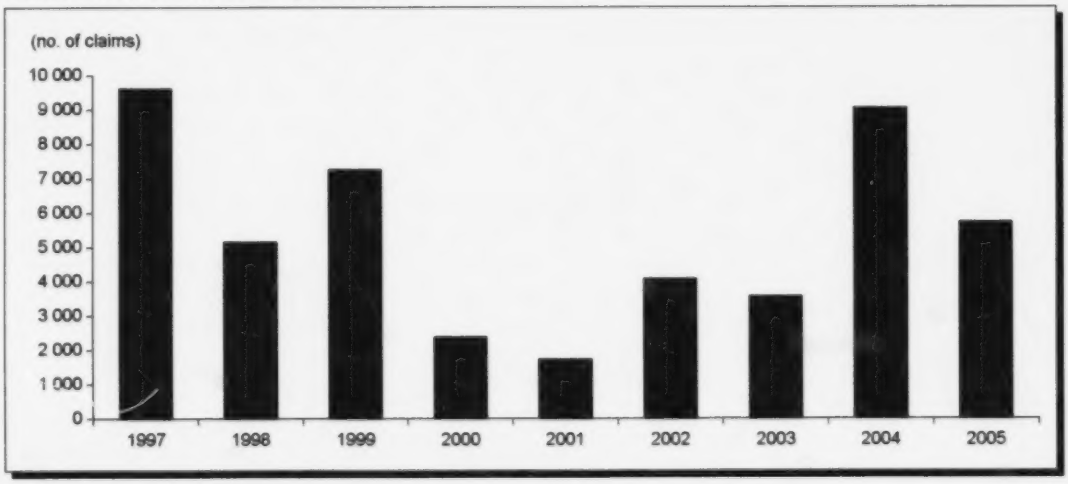
[22] The Yukon review of activities was prepared by Mike Burke. For more information, the reader is invited to contact Mr. Burke by telephone at (867) 667-3202 or by e-mail at Mike.Burke@gov.yk.ca.

Figure 38
Yukon's Exploration and Deposit Appraisal Expenditures, 1997-2005



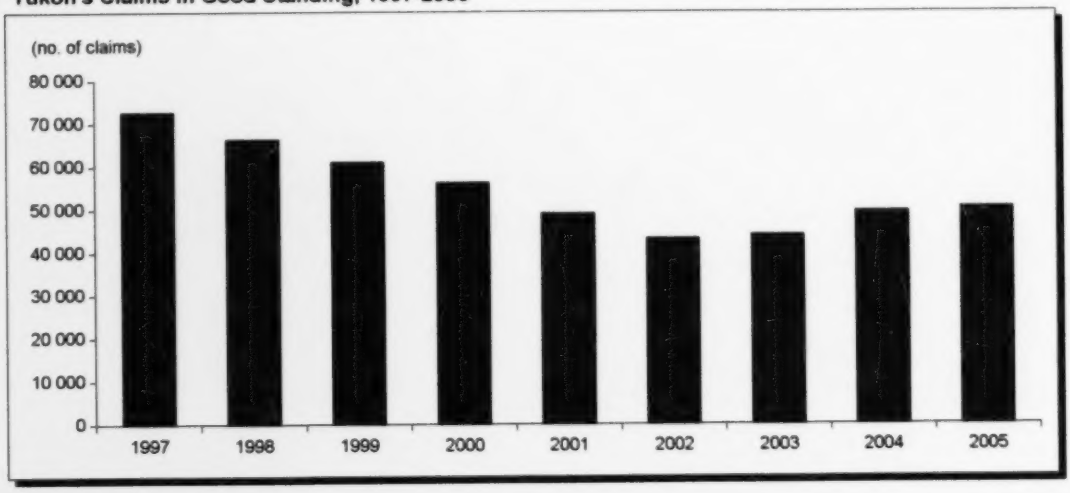
Source: Yukon Geological Survey, based on the federal-provincial/territorial Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(f) Forecast.

Figure 39
Yukon's New Claims Staked, 1997-2005



Source: Yukon Geological Survey.

Figure 40
Yukon's Claims in Good Standing, 1997-2005



Source: Yukon Geological Survey.

Approximately 450 people were directly employed at 128 placer mines in 2005 and at least several hundred more were employed in businesses and industries that serve the placer mining industry. Most of the placer operations are small and family-run with an average of three or four employees. The majority of active placer mining operations were in the Dawson mining district, followed by the Whitehorse mining district and the Mayo mining district. No active mines are currently operating in the Watson Lake mining district. Total Yukon placer gold production in 2005, to December 5, was 70 317 crude oz (2 187 115 g), compared to 76 152 crude oz (2 368 610 g) in 2004. The value of this 2005 gold production was $29.9 million.

Exploration

Base-metal exploration (mainly zinc) has benefited most from the resurgence in exploration expenditures. The largest exploration program in the Yukon was the Wolverine project of Yukon Zinc Corporation in the Finlayson Lake volcanogenic massive sulphide (VMS) district; over $20 million was spent on this project. Yukon Zinc also conducted exploration on several of its other projects in the Finlayson Lake district. Exploration for zinc has resumed in the Selwyn Basin within a late Precambrian-Devonian depositional basin, which is well known to host significant zinc-lead-silver sedimentary exhalative deposits. Pacifica Resources Ltd. acquired the Howard's Pass sedimentary exhalative deposits and conducted a major drilling program on the shallow portions of the known deposits and on exploration targets within other areas of prospective stratigraphy.

Exploration for copper, tungsten, uranium and molybdenum has also substantially increased this year. Copper exploration was targeted on several different geological settings throughout the Yukon. The largest project was conducted by Sherwood Copper Corporation after acquiring 100% of the Minto deposit. The Minto deposit is an intrusion-related magmatic-hydrothermal system that displays characteristics of both porphyry and iron oxide-copper-gold (IOCG) systems. Other projects that have copper as the primary commodity of interest are the Lucky Joe project of Kennecott Canada Exploration Inc./Copper Ridge Exploration Inc., which is a new intrusion-related magmatic-hydothermal target in the Stewart River area south of Dawson, as well as several projects targeting IOCG mineralization hosted in Wernecke breccias in the northern Yukon. Copper-gold skarn and porphyry mineralization in the Whitehorse copper belt also continued to receive some attention. Copper-nickel-platinum group element (PGE) mineralization in the Kluane mafic-ultramafic belt of the western Yukon had an increase in activity; exploration programs were conducted at Northern

Platinum Ltd./Coronation Minerals Inc.'s Wellgreen property, Golden Chalice Resources Ltd./ Strategic Minerals Ltd.'s Burwash property, and Resolve Ventures Inc.'s Klu property (optioned from Inco Ltd.). Falconbridge Limited also became active in the Kluane mafic-untramafic belt late in 2005 by optioning the Canalask property from StrataGold Corporation.

The strength in the tungsten price has resulted in a resumption of production at North American Tungsten Corporation's Cantung mine located in the Northwest Territories but accessed through the Yukon. The first tungsten concentrates from the mine were shipped in mid-October 2005. The annual concentrate production capacity from the mine is 400 000 t. Tungsten exploration increased as a result of drill programs at North American Tungsten's MacTung deposit and at Copper Ridge Exploration Inc.'s Kalzas occurrence.

Uranium exploration was focused mainly in the Wernecke Mountains area of northeastern Yukon where many occurrences of uranium-enriched IOCG mineralization are known to exist. Companies such as Cash Minerals Ltd. and Signet Minerals Inc. are active in the region, having recognized the under-explored potential of unconformity-related uranium occurrences.

Molybdenum has re-emerged as a commodity of interest for exploration companies and, in 2005, Tintina Mines conducted engineering and environmental studies on its Red Mountain deposit project in preparation for a proposed underground exploration program for 2006. Furthermore, small exploration programs were performed on the Stormy molybdenum deposit, acquired by E-Energy Ventures Inc., and on the Rams Horn molybdenum occurrence of Ordorado Resources Corp.

Exploration for precious metals has also benefited from the increase in exploration expenditures. Epigenetic gold mineralization is recognized in several different settings within the Yukon. These consist of intrusion-related gold, associated with mid-Cretaceous plutonism; orogenic gold, related to Jurassic and Eocene events; epithermal gold, related to late Cretaceous to Eocene sub-aerial volcanism; and gold skarns, related to Cretaceous, oxidized and reduced intrusions. Exploration for intrusion-related gold occurred mainly within the western portion of the Tintina gold belt between Dawson and Mayo where accessibility is greatest. StrataGold Corporation conducted the largest drill program at the Dublin Gulch deposit, north of Mayo. Drilling also occurred at Acero-Martin Exploration Inc.'s Ice property, as well as at the Mike Lake project of Bashaw Capital Corp., which was drilled for the first time. A large number of orogenic, gold-vein targets are being explored in the Dawson-Stewart River area with the most advanced program being the Lone Star property of Klondike Star Corporation. Recent work by Craig Hart of the Yukon Geological Survey has classified the belt of gold occurrences in the Hyland River area of eastern Yukon as orogenic. Epithermal gold was targeted at the Grew Creek deposit of Freegold Ventures Inc. in the Faro area and by Tagish Lake Gold Corporation at its Skukum Creek deposit south of Whitehorse.

Exploration of properties with high silver potential has also increased, as shown by the renewed exploration of several projects in the Rancheria district of southern Yukon. Work in this area included a drilling program by CMC Metals Ltd. at its newly acquired CMC property. Furthermore, exploration for silver is expected to increase substantially in 2006 with recent developments in the Keno Hill silver mining camp; Alexco Resource Corp. has an Agreement for Purchase and Sale for United Keno Hill Mines (UKHM). The Agreement for Purchase and Sale allows until March 31, 2006, if necessary, for the completion of an initial closing that is subject to negotiation of a subsidiary agreement between Alexco and the governments of Canada and the Yukon. The subsidiary agreement addresses possible solutions to the long-term environmental care, maintenance and remediation of the UKHM mine site. Negotiations regarding the key terms of the subsidiary agreement were satisfactorily carried out during the fall of 2005.

True North Gems Inc. conducted bulk sampling for emeralds on its Tsa Da Glisza property. The company also processed the bulk sample acquired in 2004 from its True Blue property and it was proven to contain blue beryls.

Yukon Geological Survey

The Yukon Geological Survey (YGS) took a significant step forward in its evolution and development when, in September 2005, it became a Directorate within the Oil, Gas and Minerals Division of the Department of Energy, Mines and Resources. The YGS is no longer part of the Mineral Resources Division and now has an expanded mandate to provide information to support exploration, development and management of not only mineral resources, but also oil and gas and, to a lesser extent, other resources such as forests. The YGS is currently being reorganized to effectively meet its new responsibility for both a higher level of management and a wider mandate. The YGS is now divided into Technical Services, Mineral Services, Regional Geology, and Mineral and Hydrocarbon Assessments.

The YGS continued to enjoy stable core funding, but a department-wide shortfall in salary dollars forced the elimination of one vacant GIS technician position. The YGS hopes to reallocate resources to fill this position in 2006. The YGS also suffered from a shortfall in short-term funding with the winding down of the INAC (Indian and Northern Affairs Canada) Knowledge and Innovation Fund and NRCan's Targeted Geoscience Initiative (TGI), but more than made up for it with funding for geophysical surveys from the new INAC Northern Economic Development program. Although the renewed TGI-3 was not available to the Yukon, and the NRCan Cooperative Geological Mapping Strategy was not funded by the federal government, the YGS remains optimistic that new funding may be available from the INAC Northern Economic Development Program or the INAC/Government of Yukon Northern Strategy. The Technical Liaison Committee to the YGS reviews its program twice a year. The YGS is grateful to Chair Gerry Carlson and the committee for their valuable support and constructive advice.

The YGS completed another successful field season with 24 projects undertaken. This year included a diversity of work that reflects its new mandate to support hydrocarbon development and to meet increased demands for baseline data to address environmental and development issues while continuing to support its primary client, the mineral industry. Projects included 1:50 000-scale bedrock mapping, mineral deposit studies, surficial studies and mapping, regional stream sediment geochemistry, and topical geology studies. In addition, several office-based projects were undertaken to advance the Yukon Geoscience database.

Yukon Mining Incentives Program

The Yukon Mining Incentives Program is currently administered by Steve Traynor. In 2005, funding was offered to 63 of 75 applications for a total of $1 009 000. Twelve of the successful applications were in the Grassroots-Prospecting, 12 in the Focused Regional, and 39 in the Target Evaluation modules. Eighty-four percent of these applicants were Yukon-based individuals or companies. The continuing trend of increasing gold prices, combined with copper prices that have doubled in the past two years, has resulted in high levels of exploration targeting these two commodities. This trend mirrored the focus of 39 of the 54 exploration projects that proceeded this year and included 10 applicants who explored for alluvial gold. Six projects explored for lead-zinc, three for molybdenum, three for silver, and three for uranium and other commodities.

Information Distribution

The YGS distributes information in three formats: (1) paper maps and reports are sold and distributed through its Geoscience Information and Sales Office; (2) many recent publications and databases are available in digital format at much lower prices than for paper copies; and (3) most of its publications are available as PDF files on its web site (www.geology.gov.yk.ca), free of charge. A catalogue of assessment reports is also available on-line (www.emr.gov.yk.ca/library). The YGS is pleased to make spatial data available through the Map Gallery interactive map server, which can be accessed through the YGS web site. The YGS continues to improve the Map Gallery. Users are encouraged to provide feedback and suggest improvements.

2.12 NORTHWEST TERRITORIES[23]

Introduction

The Northwest Territories constitutes 13.48% of Canada's total landmass.[24] The geology of the Northwest Territories encompasses over four billion years of the earth's geologic history. Base- and precious-metal mines have traditionally been the mainstay of economic activity in the Northwest Territories. However, beginning in the early 1990s, there has been a shift to diamond exploration and diamond mining. A focus has also returned to the vast oil and gas resources of the Mackenzie Valley and Delta.

On April 1, 1999, the territory of Nunavut came into existence, along with the new Northwest Territories. Ekati, Canada's first diamond mine, reached full production during the same year. Diavik, Canada's second diamond mine, commenced operations in February 2003. The Snap Lake diamond project of De Beers Canada Mining Inc. received regulatory approval in 2005 and is in the construction phase; production is expected to commence in 2008. De Beers filed for land and water licences from the Mackenzie Valley Land and Water Board for the permits required for construction and operation of the Gahcho Kué diamond mine. The applications were referred to environmental assessment.

Mineral Production Summary

The total value of metal and diamond shipments from the Northwest Territories increased to $2.157 billion in 2004 from $1.668 billion in 2003. The increase can be attributed to rises in both diamond production (from 10.76 million ct to 12.62 million ct) and diamond value. The total value of gold shipments was about $9 million in 2004, nearly an 80% decrease from 2003 primarily due to the closure of the Giant gold mine in mid-2004. A small amount of silver was also produced.[25]

Diamond shipments accounted for 99.6% of the total value of metal and nonmetal production in the Northwest Territories in 2004, with gold essentially making up the remainder. The Northwest Territories accounted for 100% of Canadian diamond production and some 0.4% of gold production during the same period. In addition, in 2004, the Northwest Territories' diamond production accounted for 8.1% of the world total by weight and about 14% by value. The Giant gold mine closed on July 7, 2004, and the CanTung tungsten mine re-opened on October 14, 2005.

Producing Mines

There are currently three operating mines in the Northwest Territories (the Ekati and Diavik diamond mines and the CanTung tungsten mine). On May 10, 2005, the De Beers Board of Directors approved total financing of $636 million for the Snap Lake mine and it is currently under construction.

Mine construction started in 2005 after full mobilization to the site over the 2005 winter road and full production is expected to begin in 2007.

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[23] This review was prepared by the Minerals, Oil and Gas Division of the Department of Industry, Tourism and Investment, Government of the Northwest Territories. For more information, the reader is invited to contact Christy Campbell by telephone at (867) 920-3345 or by e-mail at christy_campbell@gov.nt.ca.

[24] http://atlas.gc.ca/site/english/learningresources/facts/index.html.

[25] Natural Resources Canada mineral statistics (2004 preliminary), and Department of Industry, Tourism and Investment, Government of the Northwest Territories.

CanTung Mine (North American Tungsten Corporation Limited, 100%)

North American Tungsten Corporation's (NAT) CanTung tungsten mine re-opened on September 1, 2005, with initial shipment of concentrate taking place in the same month. The mill is currently processing 900 tons of ore per day and is expected to be in full production by January 2006. It was shut down in December 2003 after re-opening in January 2002. The shut-down occurred as a result of the cancellation of purchase agreements and loans by NAT's creditors. Subsequently, NAT applied for protection from its creditors and, on November 2, 2004, received approval of its Plan of Arrangement and Compromise from its creditors. After filing a restructuring plan, NAT emerged from the *Companies Creditors Arrangement Act* process on March 31, 2005. Through private placements, NAT raised funds to restart the CanTung mine. The mine employs approximately 170 people on a three-weeks-on, three-weeks-off rotation. With an annual concentrate production capacity of 400 000 metric tonne units, the CanTung mine will be the Western World's largest supplier of tungsten concentrate.

Ekati Mine (BHP Billiton Diamonds Inc., 80%; C. Fipke, 10%; S. Blusson, 10%)

The Ekati mine claim block consists of 860 000 acres. Within that block, some 150 kimberlite pipes have been identified, 20 of which have been bulk sampled. Of the 20 pipes, 8 have been permitted and are in the current mine plan. The mine was constructed between January 1997 and October 1998. Production started on October 14, 1998.

PIPES PRODUCING DIAMONDS

The main sources of ore are the Koala and Beartooth open pits, the Panda underground mine and some stockpiled material from the Misery open pit. The Panda underground project, developed at a cost of US$182 million, commenced production on April 26, 2005. It has a six-year mine life, producing 4.7 million carats (Mct) of high-quality diamonds at full production of 2600 tonnes/day (t/d).

PIPES IN THE PRODUCTION STAGE

The Fox open pit is currently under development and expected to produce diamonds by November 2005. The Koala underground project is in its pre-feasibility stage.

During 2003, Ekati produced 7.4 Mct of diamonds. This amount accounts for more than 5% of 2003 global production by weight, or about 10% by value, attesting to the high quality of Ekati diamonds. In 2004, Ekati produced 5.11 Mct of diamonds, 27% lower than that the previous year when production was boosted by an unexpected pocket of high-grade material from the Koala pit, and because of the changeover from all-surface production to some of its output coming from underground.

The kimberlite ore is currently being processed at an average rate of about 12 500 t/d, up from the original 9000 t/d as indicated in the feasibility study.

The company plans to ramp up the capacity gradually to 18 000 t/d by around 2007. The mine is slated to cease production from the eight pipes in 2015.

During 2004, the Ekati mine employed a total of 1531 person-years. Of this, 34% were Aboriginal and 65% were Northwest Territories' residents. For the same year, Northwest Territories' spending totaled $357 million representing 85.3% of total expenditures. In 2004, the processing plant operated comfortably above the initial planned capacity. In 2005, Ekati is expected to achieve its peak annual processing capacity of 2 Mt.

In 2005, the Water Licence for the Ekati mine was renewed for another seven-year period.

Diavik Diamond Mine (Diavik Diamond Mines Inc., 60%; Aber Diamond Corporation, 40%)

The Diavik diamond mine is also located in Lac de Gras, about 300 km northeast of Yellowknife and 30 km southeast of the Ekati mine. In the Diavik Joint Venture's claim block, 63 kimberlites have been discovered, about half of which are diamondiferous. The Diavik mine includes four pipes (A154 South, A154 North, A418, and A21), with initial mineable reserves standing at 27.1 Mt of ore grading 3.9 ct/t.

Permits and licences were obtained from the Government of Canada in late 1999. Construction of the mine, at a cost of $1.25 billion, was completed in January 2003.

Diamond production commenced in January 2003. In the first year of operation, Diavik produced 3.8 Mct of diamonds and mined approximately 26 Mt of waste rock and 1.3 Mt of kimberlite ore. In 2004, Diavik produced 7.6 Mct of diamonds. In the first six months of 2005, 4.26 Mct of diamonds were produced.

In 2004, an estimated 7.7 Mct were produced at an average value of $132/ct for a total value of $1 billion. The average value of diamonds from Diavik could be higher than initially estimated as a bulk sample from A154 North was valued at US$82/ct, a dramatic increase from the previous estimated US$36/ct for the pipe. In 2005, the processing plant operated comfortably above the initial planned capacity. Production of 8.0 Mct is expected for 2005.

The A418 dike was closed in October 2005. In 2006, construction to make the dike watertight will continue and instruments will be inserted to maintain permafrost and monitor performance. The construction of the A418 dike will be consistent with the A154 dike. Mining from A418 is expected to begin in 2007. Underground mining of the A154 and A418 pipes is also being assessed. A production-scale decline is being developed in 2005 and 2006 to access the lower levels of the pipes.

In 2004, a fourth pipe, A21, was removed from reserves and put into resources (the confidence in the data has been downgraded) pending bulk sample results.

In August 2005, Diavik applied for the renewal of its Water Licence, which expires in August 2007. The application was submitted at this time to allow sufficient opportunity for review and to enable the renewed Water Licence to be issued before January 2007. Diavik has requested an effective renewal date earlier than the August 2007 expiration date because, in the first quarter of 2007, Diavik will have completed the Underground Mining Feasibility Study and expects to seek investor approval to proceed with this next phase of mining. The renewed Water Licence would accompany the investor approval request.

2005 Exploration Summary

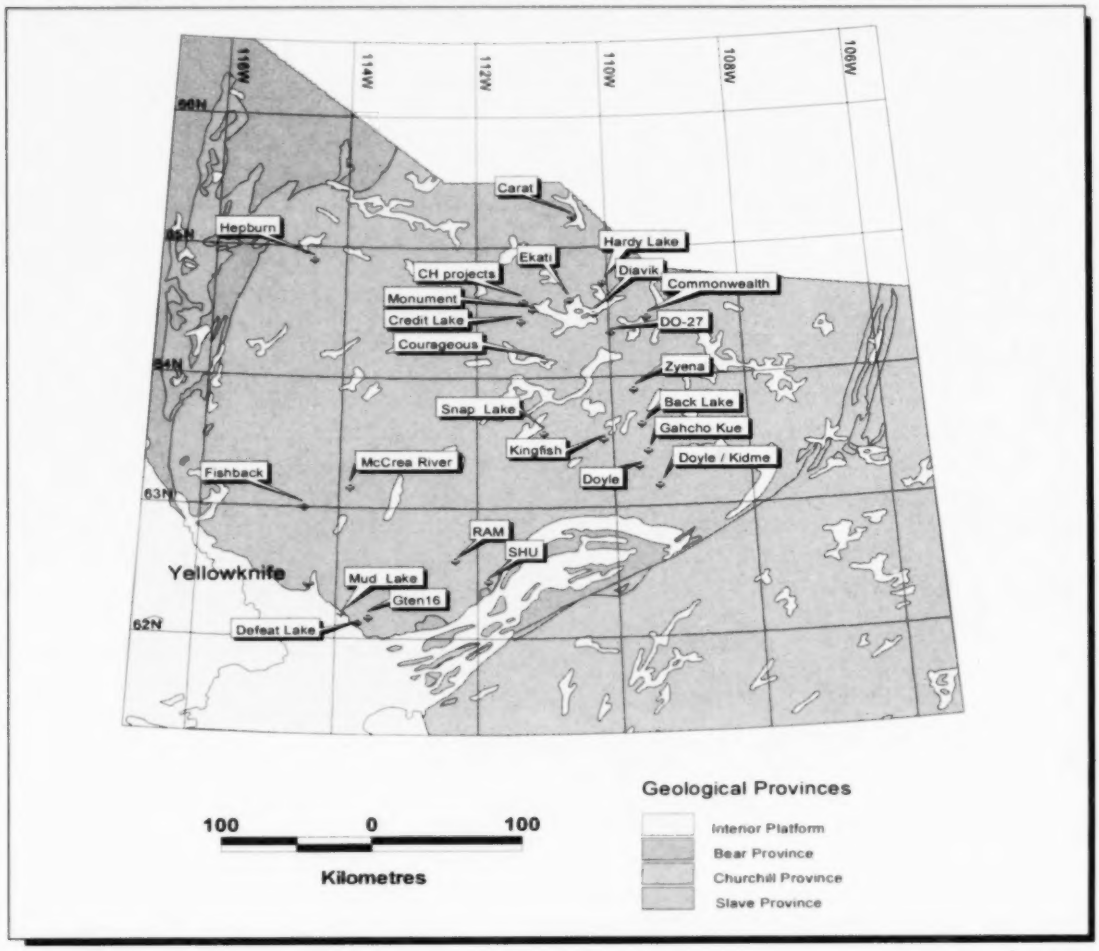
Diamonds

DIAMOND EXPLORATION ON THE SLAVE CRATON

Property locations for diamond exploration projects located on the Slave Craton can be found in **Figure 41** while the work completed on these properties is summarized in **Table 19**.

Arctic Star Diamond Corp. (100%), with Kennecott Canada Exploration Inc. retaining back-in rights, performed ground geophysics and drilled 13 holes at the Credit Lake property, targeting geophysical anomalies. No kimberlite was intersected. Subsequent to the drilling program, 590 till samples for kimberlite indicator minerals (KIM) analysis were collected to better resolve known indicator mineral trains. The property is located 32 km southwest of the Ekati mine.

Figure 41
Diamond Exploration Properties on the Slave Craton, Northwest Territories, 2005



Source: Northwest Territories Department of Industry, Tourism and Investment.

BHP Billiton Diamonds Inc. (58.8%), in a joint venture with Archon Minerals Ltd. (31.2%) and Charles Fipke (10%), continued exploration on the Buffer zone mineral leases of the Ekati diamond mine project area. Two 17.5-inch (44.5-mm) diameter reverse circulation drillholes were completed on two pipes situated in the Buffer zone. A limited core drilling program was completed consisting of five NQ (48-mm-diameter) diamond drillholes totaling 1505 m. One of the drillholes tested a geophysical target (kimberlite was not intersected); the remaining holes obtained additional information on the Jay and Wombat kimberlites. Ground magnetic and horizontal loop electromagnetic grids were also completed to better characterize the geometry of several known pipes.

BHP Billiton Diamonds Inc. (80%) in a joint venture with Charles Fipke (10%) and Stewart Blusson (10%) continued exploration on the Core zone mineral leases of the Ekati diamond mine project area.

A single, 286-m-deep, 17.5-inch (44.5-mm) diameter reverse circulation drillhole was completed on the LS-1 kimberlite pipe situated within Lac du Sauvage. Approximately 60 ct were recovered from 73 dry tonnes of kimberlite yielding an average grade of 0.8 ct/t. Eight NQ (48-mm-diameter)

TABLE 19. NORTHWEST TERRITORIES, SUMMARY OF SLAVE PROVINCE DIAMOND EXPLORATION WORK, 2005

Operator/Partners	Property	Drilling	Airborne Geophysics	Ground Geophysics	Sampling and Other Work
Arctic Star Diamond Corp.	Credit Lake	13 holes		Yes	590 till HM samples
BHP Billiton Diamonds/ C. Fipke/Archon Minerals	Buffer Zone Leases	2-17.5" RC holes, 1505 m NQ in 5 holes		Mag and HLEM	
BHP Billiton Diamonds/ S. Blusson/C. Fipke	Core Zone Leases	286 m in 1 - 17.5" RC hole, 1795 m NQ in 8 holes			Mini-bulk sample grade determination on reverse circulation chips, caustic fusion microdiamond recovery of core
De Beers Canada/Mountain Province Diamonds/ Camphor Ventures	Gahcho Kué				Permitting, environmental assessment, consultation
Diamondex Resources	Kingfish		1592 line-km helicopter Resolve EM and Mag		Till sampling
Diamondex Resources/ Majescor Resources	Carat	4 holes			
Diavik Diamond Mines	Diavik Claims/ Leases	1500 m core drilling	1500 line-km Mag gradiometry and EM	Mag, gravity and HLEM	
Diamonds North Resources	Hepburn				Ca. 1000 till samples
GGL Diamond	Doyle Lake	4 holes			45-t bulk sample, caustic fusion microdiamond recovery of core
GGL Diamond	Fishback	691 m in 4 holes NQ			
GGL Diamond	CH projects			Yes	134 till HM samples, ground checks on 84 geophysical anomalies
Consolidated Gold Win/ New Shoshoni Development	Glen 16	2 holes			
De Beers Canada/Majescor Resources	Hardy Lake	764 m in 2 holes			Caustic fusion microdiamond recovery of core
De Beers Canada/Majescor Resources	McCrea River/ Thetis Lake			2 grids	
New Nadina Explorations/ SouthernEra Diamonds/ Archon Minerals	Monument	513.6 m in 6 holes		117 line-km Mag, 97 line-km HLEM in 5 grids	Caustic fusion microdiamond recovery of core
New Shoshoni/Snowfield Development/Consolidated Gold Win	Defeat Lake	138 m in 1 hole			
Peregrine Diamonds/ Archon Minerals/Aber Diamond/DHK Diamonds/ SouthernEra Diamonds	DO-27	151-t RC sample in 6 holes; 2400 m core in 15 holes			Heavy media separation for macrodiamond recovery on RC chips
Pure Gold Minerals/De Beers Canada Exploration	Courageous Lake	3 holes			Till HM sampling
Snowfield Development/ David Smith	Mud Lake	32 holes			Caustic fusion microdiamond recovery of core
SouthernEra Diamonds/ Kalahari Resources/Island Arc Mining	Back Lake	1 hole			
Trigon Exploration/Contact Diamond	RAM	13 small-diameter RC holes			204 till HM samples, surficial mapping
Trigon Exploration/Contact Diamond	SHU				114 till HM samples, surficial mapping
Trigon Exploration	Zyena				52 till HM samples, surficial mapping

Source: Northwest Territories' Department of Industry, Tourism and Investment.
RC Reverse circulation; Mag Magnetic; EM Electromagnetic; HLEM Horizontal loop electromagnetic; HM Heavy mineral.

diamond drillholes were completed totaling 1795 m. Four of the drillholes tested kimberlite targets, while the remaining drillholes obtaining additional information on known pipes. Two new kimberlite bodies were discovered (Rat East and Eagle) and microdiamond analysis from caustic fusion of the drill cores is pending. A total of 154 kimberlite occurrences have now been confirmed on the Ekati diamond mine property (Core zone and Buffer zone joint ventures).

De Beers Canada Inc. (51%), in a joint venture with Mountain Province Diamonds Inc. (44.1%) and Camphor Ventures Inc. (4.9%), announced that $38.5 million will be spent on the Gahcho Kué property. The money will be used to finance the environmental assessment and permitting processes, consultation and stakeholder engagement, and large-diameter drilling on the 5034 and Tuzo kimberlite bodies.

Diamondex Resources Ltd. completed a 1592-line-km helicopter-borne RESOLVE magnetic and electromagnetic survey, and took till samples from its wholly owned Kingfish claims located about 260 km northeast of Yellowknife. Diamond drilling is slated for late 2005.

Diamondex Resources Ltd. (70%) in a joint venture with Majescor Resources Inc. (30%) drilled four geophysical and geochemical targets on the Carat property, 350 km northeast of Yellowknife.

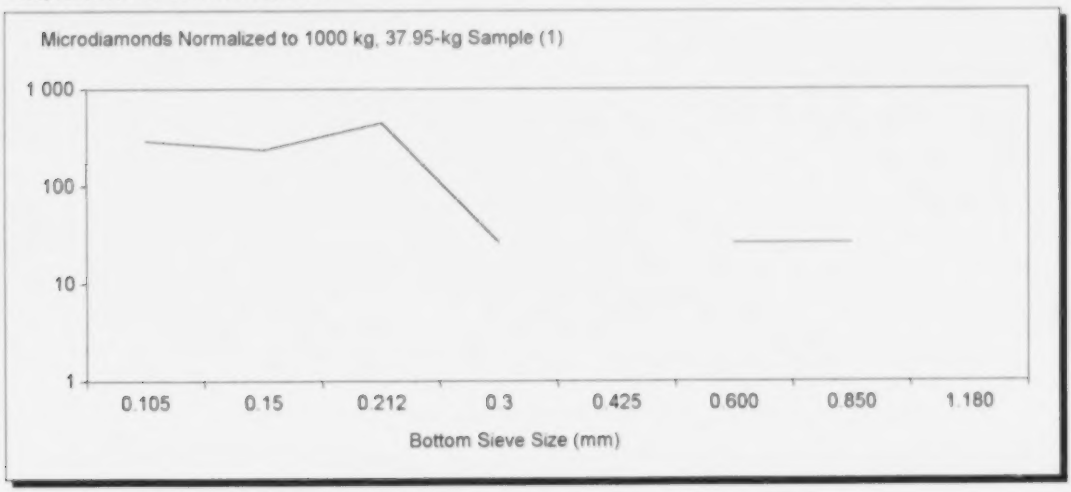
Diamonds North Resources collected approximately 1000 till samples on its wholly owned Hepburn project located 300 km north of Yellowknife. Preliminary results indicate an up-ice cut-off to background KIM counts from the Lac de Gras kimberlite field, as well as delicate surface features being preserved on KIM grains. Both features point towards a local source for the KIM grains collected from the work.

Diavik Diamond Mines Inc. carried out a 3000-line-km airborne gradiometer-magnetic and 1500-line-km airborne electromagnetic surveys near the Diavik mine. Additionally, the company completed several detailed ground magnetic, horizontal loop electromagnetic and gravity surveys. A total of 1500 m of drilling was completed on kimberlite targets near the Diavik mine.

GGL Diamond Corp. (100%) collected a 45-t bulk sample from one surface pit on the gently northwesterly dipping Doyle Lake kimberlite sill. Four vertical diamond drillholes have extended the known extent of the dike 820 m down dip to vertical depths of 200 m. Kimberlite from this year's drilling will be sent for microdiamond analysis. Earlier in the year, GGL performed caustic fusion analysis on archived samples from 1996 Mountain Province drilling on the sill. Nine kimberlite samples from holes DO-96-168, 171, 173, 174 and 175 provided 37.95 kg of kimberlite for caustic fusion. Forty stones were recovered, including two macrodiamonds, from holes DO-96-174 and 175 (**Figure 42**).

On its wholly owned Fishback property, 65 km northwest of Yellowknife, GGL Diamonds drilled four NQ holes totaling 691 m. Although the holes did not intersect kimberlite, three drillholes

Figure 42
Microdiamonds Recovered From Caustic Fusion Analysis of 1996 Archived Samples, Doyle Lake Sill, Northwest Territories, 2005



Sources: GGL Diamond Corp.; Northwest Territories Department of Industry, Tourism and Investment.
(1) Nine kimberlite samples from holes DO-96-168, DO-96-171, DO-96-173, DO-96-174 and DO-96-175 provided 37.95 kg of kimberlite for caustic fusion analysis.

intersected zones of highly brecciated, carbonate-altered granite. The core was sampled for kimberlite indicator minerals and geochemical analysis.

GGL Diamond Corp. carried out ground geophysics on its wholly owned Courageous and Seahorse properties in the CH area, approximately 250 km northeast of Yellowknife. They also ground checked 84 airborne geophysical anomalies on the Seahorse, Courageous, Winter Lake North, BP, Winter Lake South, and Zip properties, and collected 134 till samples for KIM analysis.

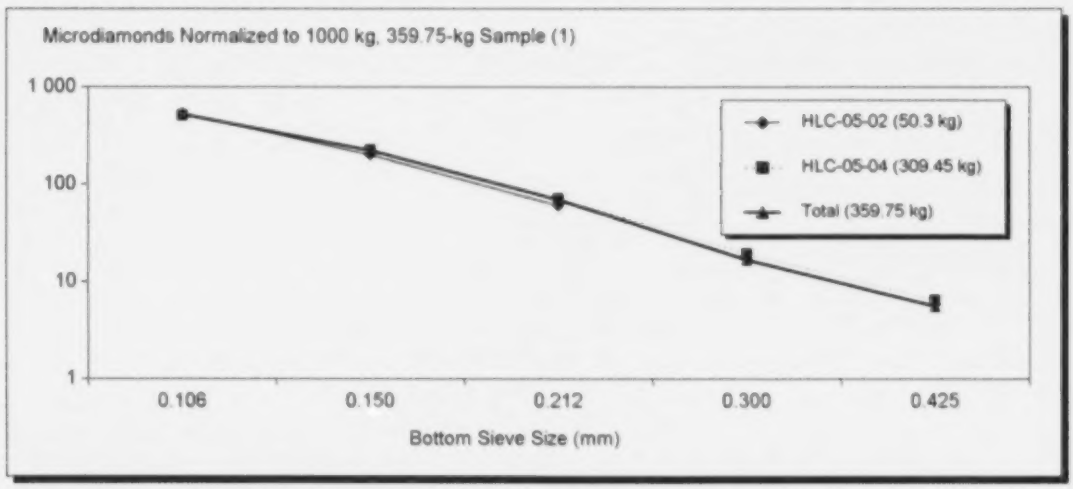
Consolidated Gold Win Ventures, earning in a 49% interest on New Shoshoni Development Corporation's Gten16 claim, drilled two holes on a geophysical anomaly. The first hole intersected non-magnetic granite and the geophysical anomaly remains unexplained. A second hole into the anomaly was started but aborted prior to target depth due to deteriorating ice conditions. The property is located 60 km east-southeast of Yellowknife.

On the De Beers Canada Hardy Lake property, 350 km northeast of Yellowknife, Majescor Resources Ltd., under an option to purchase, completed two holes totaling 764 m. Both holes intersected an olivine macrocrystic kimberlite facies to extend the Jack Pine kimberlite to a length of 500 m along a North-South axis. Kimberlitic core was submitted for microdiamond recovery by caustic fusion. Results from the two holes are reported in **Figure 43**.

On the DeBeers Canada Thetis Lake and McCrea River properties, 150 km north of Yellowknife, Majescor Resources Ltd., under an option to purchase, completed ground geophysical surveys over the heads of two KIM trains. Weather conditions precluded drilling the two targets; consequently, this work was deferred to 2006.

New Nadina Explorations Ltd. (57%), in partnership with SouthernEra Diamonds Inc. (22%) and Archon Minerals Ltd. (20%), explored the Monument property, 40 km north of the Ekati mine. The partners completed five ground geophysical grids that included 117 line-km of magnetic and 97 line-km of horizontal loop electromagnetic surveys. Six diamond drillholes totaling 513.6 m, spotted near the DD-42 kimberlite pipe, resulted in the discovery of a 0.65-m to 3-m (true width) steeply dipping kimberlite dike with a strike length of at least 250 m.

Figure 43
Microdiamonds Recovered From Caustic Fusion Analysis of Core From the Jack Pine Kimberlite, Northwest Territories, 2005



Sources: Majescor Resources Ltd.; Northwest Territories Department of Industry, Tourism and Investment.
(1) A total of 359.75 kg of kimberlite core from holes HLC-05-02 and HLC-05-04 at Hardy Lake were analyzed by caustic fusion.

New Shoshoni Ventures Ltd. (75%), in a joint venture with Snowfield Development Corp. (15%) and Consolidated Gold Win Ventures Inc. (10%), drilled 138 m in one hole into a magnetic anomaly in Defeat Lake on the Defeat Lake property. They intersected an altered granite breccia with a sandstone or tuffaceous matrix. The matrix has been submitted for kimberlite indicator mineral analysis.

Peregrine Diamonds Ltd. (54%), in partnership with Archon Minerals Ltd. (13%), Aber Diamond Corp. (7%), DHK Diamonds Inc. (20%) and SouthernEra Diamonds Inc. (4.9%), extracted a 151-t bulk sample from the central lobe of the DO-27 kimberlite. The sample yielded an average grade of 0.89 ct/t with 21 stones greater than 0.5 ct (**Table 20**). The mini-bulk sample was divided into two packages based on the petrography of the kimberlite. The diamond parcel extracted from the pyrope and chrome diopside-rich facies averaged a grade of 0.98 ct/t and included approximately 78% of the total diamonds recovered by weight. The second parcel, collected from an olivine-rich facies of the kimberlite, returned an average grade of 0.70 ct/t and returned 22% of the total diamonds by weight. The first parcel was valued at between US$58 and $78/ct, and the second was valued at US$32-$35/ct.

Both parcel sizes are deemed too small to be used for feasibility work. Three diamond drillholes totaling 750 m extended the known depth of the kimberlite to 465 m. A further 1650 m in 12 holes were drilled on DO-27 and 1000 m of drilling is planned for nearby DO-18.

Pure Gold Minerals Inc. is earning in up to 85% in an option agreement with De Beers Canada Exploration Inc. on the Courageous Lake property located 240 km northeast of Yellowknife. The partners prospected and collected till samples on a number of geophysical anomalies coincident with the heads of KIM trains on the property. A review of existing data, coupled with 2005 exploration, led to the drilling of three targets. None of these holes intersected kimberlite.

Near Drybones Bay, 50 km east-southeast of Yellowknife, Snowfield Development Corp. is earning in to 80% under an option agreement with David Smith on the Mud Lake kimberlite. Snowfield drilled 28 holes to test the strike length of the gently dipping Mud Lake kimberlite sill and reported kimberlite intersections up to 3.56 m thick in 13 holes. Four holes were drilled on separate magnetic anomalies. Snowfield plans to extract a 500-t bulk sample from the Mud Lake sill this winter.

SouthernEra Diamonds Inc., in a joint venture with Kalahari Resources Inc. and Island Arc Mining Corp., drilled one hole on the Back Lake project.

Trigon Exploration Canada Ltd. (47%), in a joint venture with Contact Diamond Corp. (53%), drilled 13 small-diameter reverse circulation holes into 10 separate geophysical targets on the RAM

TABLE 20. NORTHWEST TERRITORIES, BULK SAMPLE DIAMOND RECOVERY RESULTS FROM THE DO-27 KIMBERLITE

Reverse Circulation Hole	Depth	Sample Weight	Total Carats	Grade	Stones	Largest Stones
	(m)	(dry t)	(ct)	(ct/t)	(>0.5 ct)	(ct)
PYROPE, CHROME DIOPSIDE-RICH FACIES						
RC 1	209	45.74	47.32	1.03	4	2.93, 1.62
RC 2	124	28.96	27.66	0.96	5	1.85, 0.96, 0.94
RC 4	93.5	12.02	11.99	1	1	2.66
RC 5	83	12.2	11.66	0.96	3	0.76
RC 6	77	9.54	7.4	0.78	1	0.5
Total		108.47	106.03	0.98	14	
OLIVINE-RICH FACIES						
RC 3	190.5	42.8	29.93	0.7	7	0.98
Total		151.27	135.96	0.89	21	

Sources: Peregrine Diamonds Ltd.; Northwest Territories Department of Industry, Tourism and Investment.

property, located 140 km northeast of Yellowknife. No kimberlite was intersected. Two hundred and four till samples were also collected in order to refine the source areas of the KIM trains. The exploration work also entailed drift mapping and ice-flow direction studies.

Trigon Exploration Canada Ltd. (47%), in a joint venture with Contact Diamond Corp. (53%), collected 114 till samples to refine the source areas of KIM trains on the Shu property, located 120 km east of Yellowknife.

On its wholly owned Zyena property, 220 km northeast of Yellowknife, Trigon collected 52 samples for KIM analysis and completed some targeted drift mapping.

DIAMOND EXPLORATION OFF THE SLAVE CRATON

Property locations for diamond exploration projects off of the Slave Craton can be found in **Figure 44** while **Table 21** summarizes the work completed on these properties.

Arctic Star Diamond Inc. collected 272 till and esker samples on a nominal 3-km^2 grid pattern over high-potential portions of its wholly owned Dymond Lake permits. The 2-million-acre property is located about 360 km north of Fort Smith.

On the Parry Peninsula near Paulatuk, Diadem Resources Ltd., in a joint venture with Darnley Bay Resources Ltd., explored the Franklin diamond project.

The property is composed of a group of permits and claims under various joint-venture and earn-in arrangements. In 2005, the partners flew a 52 836-line-km airborne magnetic gradiometer survey over portions of the property and collected an additional 223 till samples over geophysical anomalies and poorly resolved indicator mineral trains. A soil sample line across the known "105" kimberlite was completed and analyzed using the Soil Gas Hydrocarbons technique. The soil gas profile successfully delineated the kimberlite.

In the Interior Plains, Diamondex Resources Ltd. explored the 6.17-million-acre Lena West project area, north of Norman Wells. Exploration work focused on four target areas defined by previous heavy mineral sampling. Four geophysical anomalies were studied by transient electromagnetic (TEM) and reflective/refractive seismic surveys, and a 6759-line-km of 100-m line spacing GEOTEM survey was flown over several high-priority targets. Spring drilling intersected no kimberlite; however, the geophysical anomalies being tested remain unexplained. The program also included stream sampling and the collection of 1724 till samples.

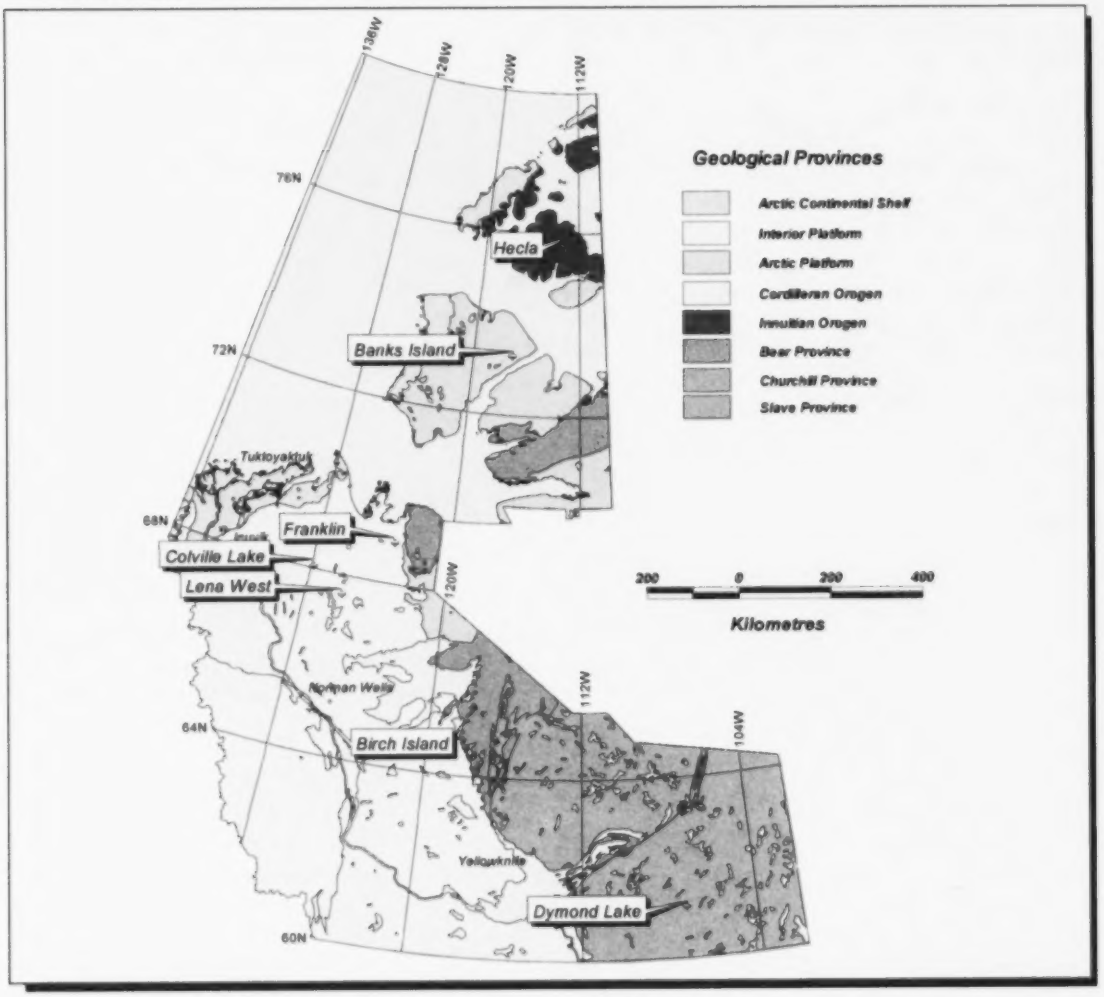
Diamondex Resources collected geochemical samples and conducted ground magnetic surveys over its wholly owned Birch Island permits between Norman Wells and Tulita.

Diamonds North Resources and Majescor Resources Ltd. sampled and prospected on their high arctic Banks Islands permits.

Shear Minerals Ltd. prospected, sampled and mapped its wholly owned Hecla permits on northern Melville Island. The work targeted several circular structures within platformal sedimentary cover, visible in aerial photographs of the area.

Pure Gold Minerals Inc. is earning in to 85% on De Beers Canada's Colville Lake permits, north of Norman Wells. Pure Gold flew a 20 000-line-km airborne magnetic survey as well as 8000 line-km of airborne electromagnetic survey. The electromagnetic data were collected over areas with magnetic anomalies identified in a 2004 airborne geophysical survey. Pure Gold Minerals also continued with till sampling throughout the permit area.

Figure 44
Diamond Exploration Properties Off of the Slave Craton, Northwest Territories, 2005



Source: Northwest Territories Department of Industry, Tourism and Investment.

TABLE 21. SUMMARY OF DIAMOND EXPLORATION OFF OF THE SLAVE CRATON, 2005

Operator/Partners	Property	Drilling	Airborne Geophysics	Ground Geophysics	Sampling and Other Work
Arctic Star Diamond	Dymond Lake				272 till and esker HM samples
Diadem Resources/ Darnley Bay Resources	Franklin		52 836 line-km Mag gradiometer		223 till HM samples, soil gas hydrocarbon sampling
Diamondex Resources	Lena West	Yes	6759 line-km GEOTEM	4 grids transient electromagnetic, seismic reflection/ refraction Mag surveys	1724 stream and till HM samples
Diamondex Resources	Birch Island				Geochemical sampling
Diamonds North Resources/ Majescor Resources	Banks Island				Sampling and prospecting
Shear Minerals	Hecla				Prospecting, sampling
Pure Gold Minerals/ De Beers Canada Exploration	Colville Lake		20 000 line-km Mag, 8000 line-km EM		Till HM sampling

Source: Northwest Territories Department of Industry, Tourism and Investment.
RC Reverse circulation; Mag Magnetic; EM Electromagnetic; HLEM Horizontal loop electromagnetic; HM Heavy mineral

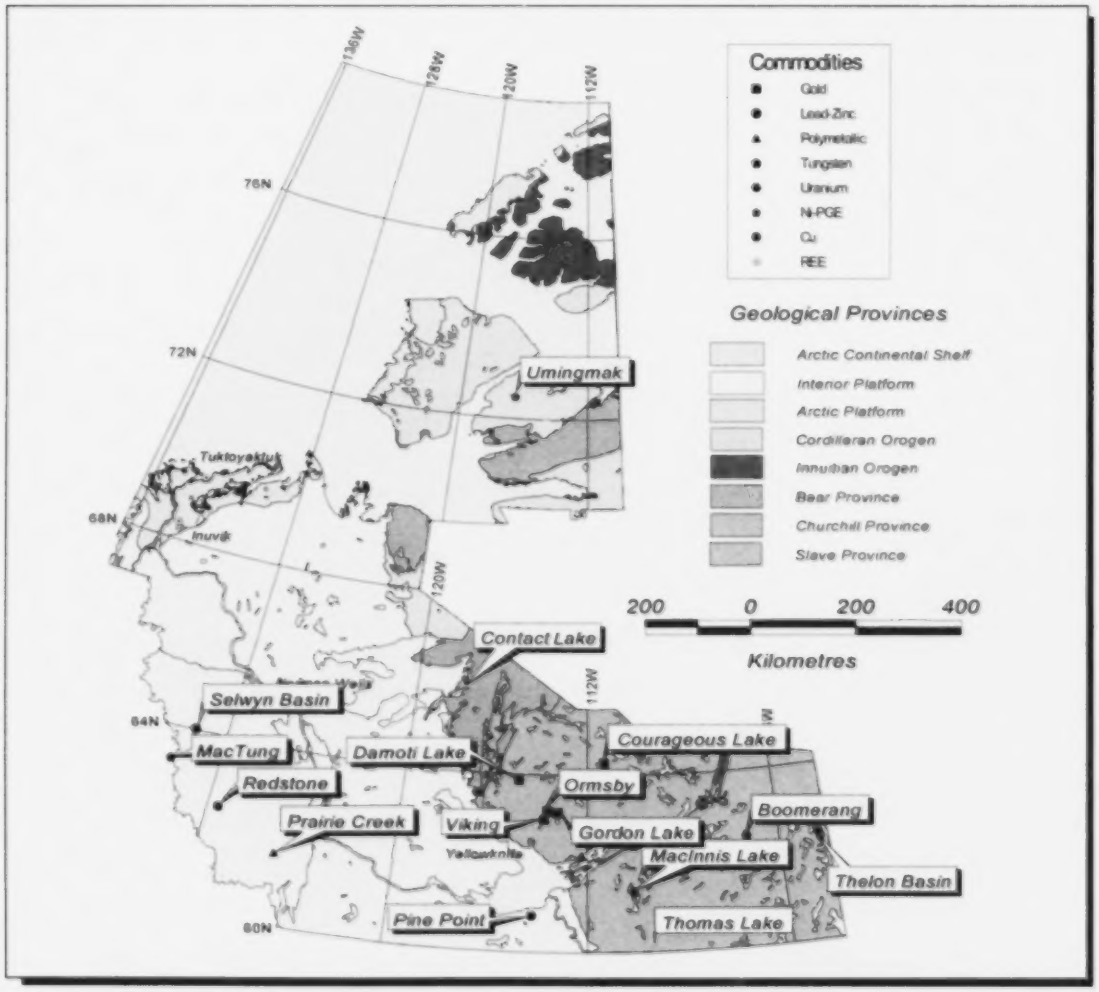
Metals

Locations for metal exploration properties mentioned in the text can be found in **Figure 45**. **Table 22** summarizes the work done on gold projects and **Table 23** summarizes the work completed on base-metal and polymetallic properties.

GOLD

Anaconda Gold Corporation completed 1470 m of drilling in 13 holes on the Damoti property located 200 km north of Yellowknife. Anaconda is earning in to 55% from Doublestar Resources on the Damoti property by completing $2.5 million in exploration expenditures over a four-year period. The drilling was designed to extend the Horseshoe zone and test other exploration targets on the property, including the Lookout zone, approximately 200 m north of the Horseshoe zone. A hole confirming mineralization in the Horseshoe zone returned an intersection of 33.88 g/t gold over 3.61 m. The best intersection from 12 holes on the Lookout zone was 11.68 g/t gold over 2.50 m.

Figure 45
Precious-Metal and Base-Metal Exploration Projects in the Northwest Territories, 2005



Source: Northwest Territories Department of Industry, Tourism and Investment.

TABLE 22. NORTHWEST TERRITORIES, SUMMARY OF GOLD EXPLORATION, 2005

Operator/Partners	Property	Drilling	Airborne Geophysics	Ground Geophysics	Sampling and Other Work
Anaconda Gold	Damoti Lake	1470 m in 13 holes			
Boxxer Gold/397405 Alberta	Gordon Lake	522 m in 11 holes			
Seabridge Gold	Courageous Lake	12 holes			Resource modelling
Tyhee Development	Yellowknife Gold	4832 m in 15 holes surface, 4543 m in 57 holes underground	Helicopter Mag and EM		Underground development, 700 m drifting and ramping, 80 m raising, 6800-t bulk sample stockpiled, metallurgical studies, pre-feasibility studies
Viking Gold/Lakota Resources	Viking	300 m in 18 holes			Core re-logging and resampling, soil geochemistry survey

Source: Northwest Territories Department of Industry, Tourism and Investment.
Mag Magnetic; EM Electromagnetic.

TABLE 23. NORTHWEST TERRITORIES, SUMMARY OF BASE-METAL AND POLYMETALLIC EXPLORATION, 2005

Operator/Partners	Property	Commodity (ies)	Drilling	Airborne Geophysics	Ground Geophysics	Sampling and Other Work
Alberta Star Development/ Max Resource	MacInnis Lake	U		951 line-km MEGATEM and GEOTEM Mag and EM		
Alberta Star Development	Contact Lake	U		MEGATEM Mag and EM	Mag	Mapping, sampling
Canadian Zinc	Prairie Creek	Pb-Zn-Ag				Metallurgical testing, mine-planning, permitting
Eagle Plains Resources	Selwyn	Pb-Zn				Sampling, mapping, showing inspections
Great Northern Mining and Exploration	Umingmak	Ni-PGE		17 000 line-km MEGATEM Mag and EM		3400 till samples for MMI analysis, 600 conventional soil geochemistry samples
Lumina Resource	Redstone	Cu			IP and seismic	
North American Tungsten	MacTung	W	6000 m in 25 holes			100-t bulk sample, rehabilitation of underground workings, channel sampling
Pathfinder Resources/ Diamonds North Resources	Thelon Basin	U		Mag and radiometric surveys		Regional till geochemistry, radioactive boulder prospecting, soil and rock geochemistry
Robin Day	Thomas Lake	REE				Soil and rock geochemistry, till HM sampling
Tamerlane Ventures	Pine Point	Pb-Zn	22 holes			Geochemical sampling, environmental studies
Uravan Mineral/Cameco	Boomerang	U		7600 line-km MEGATEM II Mag and EM		
Wyn Developments	Hearne Channel	Co-Ni				Gridding, re-assaying

Source: Northwest Territories Department of Industry, Tourism and Investment.
Mag Magnetic; EM Electromagnetic; IP Induced polarization; MMI Mobile metal ion leach; HM Heavy mineral; U Uranium; Pb Lead; Zn Zinc; Ag Silver; Ni Nickel; PGE Platinum group elements; Cu Copper; W Tungsten; REE Rare earth elements; Co Cobalt.

Boxxer Gold Corp. drilled 522 m in 11 holes to test geophysical anomalies between the Main, South and Union mineralized zones on its Gordon Lake property located 110 km northeast of Yellowknife. The company is earning in to 90% on the property from 397405 Alberta. The gold mineralization is hosted in quartz veins within a sheared and silicified argillite. Highlights from the drill program include 1.45 m grading 4.12 g/t gold, 2.71 m grading 20.35 g/t gold, and 5.37 m grading 8.8 g/t gold from the Main, South and Union zones, respectively.

Seabridge Gold Inc. drilled four holes on the FAT deposit of its wholly owned Courageous Lake property (located north of the former Salmita gold mine). It intersected three zones of mineralization extending 400 m north of previous drilling within quartz-sericite altered structures hosted in felsic ash tuffs. An additional five of eight holes drilled to test the southern extension of the deposit intersected mineralization assaying up to 3.65 g/t gold over 3.0 m. A preliminary revised resources assessment is presented in **Table 24**.

Tyhee Development Corp. carried out extensive exploration work on the Ormsby zone of its wholly owned Yellowknife Gold project area, located 88 km north of Yellowknife. Fifteen surface drillholes totaling 4832 m tested deeper portions of the Ormsby zone. Drilling found ore grade intersections well below the limits of drilling from the underground workings. The Ormsby zone was also extended on surface where a 350-m by 150-m zone of silicified sulphide-bearing hydrothermal breccia was documented. A helicopter-borne electromagnetic and magnetic survey was flown over much of the property.

Underground exploration and development included 700 m of ramping, drifting and crosscutting, as well as the completion of 80 m of raise development.

Approximately 6800 t of mineralized rock has been stockpiled at surface from the development work. Underground drilling comprised 4543 m in 57 holes and focused on the 30 and 60 zones, with centring on 12.5-m fences to characterize the geometry of these orebodies. Prior to this year's exploration, the resources for the Yellowknife Gold project had been estimated using a 1g/t gold cut-off (**Table 25**).

The resource description is currently being recalculated to reflect 2005 data. Metallurgical tests indicated over 95% gold recovery from the ore. Permitting and preparation of a pre-feasibility study are ongoing.

Viking Gold Corporation has a right to earn in to 60% from Lakota Resources Inc. on the past-producing Morris Lake gold property. Dubbed the Viking Gold project, 2005 work included approximately 3000 m of diamond drilling in 18 holes, re-logging of selected 1988 Canmax core stored on site, surface mapping of outcrops on the property, and a soil geochemistry survey along the mineralized trend in covered areas. Encouraging results from diamond drilling and sampling have led the company to stake additional claims south of the existing property and to option two mining leases from Aur Resources.

TABLE 24. GOLD RESOURCES (1) AT THE COURAGEOUS LAKE PROPERTY, NORTHWEST TERRITORIES, OCTOBER 2005

Resource Category	Tonnes	Grade	Ounces
	(000)	(g/t)	(000)
Measured	3 378	2.55	277
Indicated	47 002	2.28	3 445
Inferred	77 442	2.10	5 229

Sources: Seabridge Gold Inc.; Northwest Territories Department of Industry, Tourism and Investment.
(1) A cut-off grade of 0.83 g/t was used.

TABLE 25. GOLD RESOURCES (1) IN THE ORMSBY ZONE, NORTHWEST TERRITORIES, FEBRUARY 2005

Resource Category	Tonnes	Grade	Ounces
	(000)	(g/t)	(000)
Measured	1 692	8.82	480
Indicated	1 314	9.03	382
Inferred	1 223	7.57	298

Sources: Tyhee Development Corp.; Northwest Territories Department of Industry, Tourism and Investment.
(1) A cut-off grade of 3.5 g/t was used.

PLATINUM GROUP ELEMENTS AND BASE METALS

Alberta Star Development Corp., in an option agreement with MAX Resource Corp., explored for unconformity-related uranium by flying a 951-line-km, 200-m line spacing, deep penetrating MEGATEM and GEOTEM airborne electromagnetic and magnetic survey over the MacInnis Lake claims. Located in the Nonacho Basin, 150 km northeast of Fort Smith, the MEGATEM survey covered the southern 40% of the property. Known mineralization from previous drilling appears to correspond with conductors identified by the geophysical surveys.

Alberta Star Development Corp. flew a MEGATEM survey and mapped and performed ground magnetics in a search for iron oxide-copper-gold deposits at Contact Lake, 5 km southeast of the former Port Radium mine on the east side of Great Bear Lake.

Canadian Zinc Corporation continued work at its wholly owned Prairie Creek zinc-lead-silver mine, 150 km west of Fort Simpson. Metallurgical bench testing of ore samples collected in 2004 yielded encouraging results: different ore types can be co-mingled without affecting recovery and acceptable recoveries can be obtained through flotation without cyanidation. The company also worked on mine planning studies, permitting activities, and engineering studies.

Eagle Plains Resources Ltd. carried out sampling and inspections on several known zinc-lead showings on its wholly owned Selwyn Basin permits and claims. The property is centred 190 km west of Norman Wells.

The work was aimed at supporting laboratory work to provide the primary geological characteristics of the mineralizing systems at play in the area.

Great Northern Mining and Exploration explored its wholly owned Victoria Island Umingmak project for nickel and PGEs. Exploration this year included a 17 000-line-km MEGATEM survey concurrent with the collection of approximately 3400 till samples for MMI analyses and an additional 600 conventional soil samples.

Lumina Resource Corporation is currently completing an induced polarization and seismic survey over its wholly owned Redstone copper property.

North American Tungsten Corp. drilled 6000 m in 25 holes to upgrade and extend the resources of its wholly owned Mactung tungsten deposit. Assay results from the first 11 holes of the program have been received and are encouraging. The drilling is designed to firm up resource estimates from inferred to indicated in open-pit and underground mineralized horizons. In conjunction with the surface drilling, an underground program entailed the rehabilitation of the 1973 adit, the collection of 27 channel samples, and the collection of a 100-t bulk sample for metallurgical testing. The work will form the basis for a new resource estimate and feasibility study in the coming year. Exploration drilling also took place on claims at Rifle Range Creek, 6 km from the Cantung mine.

Pathfinder Resources Ltd., in an option agreement with Diamonds North Resources Ltd., can earn in to 80% on the uranium rights for the 2.5-million-acre Thelon Basin property, located 500 km east of Yellowknife. The partners flew airborne magnetic and radiometric surveys, and performed regional till sampling and closely spaced geochemical soil and rock sampling in areas with known radioactive sandstone boulders in order to evaluate both the uranium and diamond potential of the property.

Robin Day prospected and sampled on his wholly owned Thomas Lake permit. The results of geochemical sampling for rare earth minerals were disappointing. Heavy minerals sampling from eskers returned low counts of potential KIMs. Mineral chemistry results are pending.

Tamerlane Ventures is earning in to 60% from Kent Burns Group LLC on the Pine Point property, located 75 km east of Hay River. Tamerlane drilled 22 holes both confirming and expanding known

mineralization. Drilling tested the W-85, GO-3 and R190 targets. The new drilling met or exceeded the historical exploration results and the company has commenced environmental studies to support the project.

Cameco Corporation is earning in to 60% on Uravan Minerals Inc.'s wholly owned Boomerang project comprised of five mining leases and 153 mineral claims, 480 km east of Yellowknife. The partners flew 7600 line-km of MEGATEM II survey with a 250-m line-spacing. Based on preliminary results from this survey, Uravan staked additional claims to protect favourable EM and structural trends adjacent to the core property.

Wyn Developments re-assayed several high-grade samples collected from its Hearne Channel nickel-cobalt property, located 135 km east-southeast of Yellowknife. The company also established a detailed grid in preparation for a ground gravity survey and diamond drill program planned for late 2005. Wyn Developments is earning in to 100% in an option agreement with Impala Resource Services.

On-Line Resources

Information on the location and status of mineral claims can be obtained from the on-line Spatially Integrated Dataset (SID) at http://nwt-tno.inac-ainc.gc.ca/ism-sid/sidinfo_e.asp. SID is a combined initiative of Indian and Northern Affairs Canada and the Government of the Northwest Territories.

A guide to the regulatory framework for mineral development in the Northwest Territories can be viewed at http://nwtmineralspathfinder.com.

Mineral exploration data can also be found on-line through NORMIN.DB, the mineral showings database for the Northwest Territories (www.nwtgeoscience.ca/normin/).

Mineral exploration data from assessment reports can now be downloaded free of charge through the Northwest Territories Geoscience Office Gateway System at www.nwtgeoscience.ca/gateway/browseA.php.

Report on Northwest Territories Geoscience Office Activities – 2005

Located in Yellowknife, the Northwest Territories Geoscience Office (NTGO) is staffed and funded by Indian and Northern Affairs Canada, the Government of the Northwest Territories, and the Geological Survey of Canada (GSC). NTGO geoscientists provide expertise on the geology of the Northwest Territories, including its mineral and petroleum resources. They carry out bedrock mapping, studies of mineral and energy potential, and non-renewable resource assessments to support land-use planning and conservation efforts. In addition, the NTGO compiles, manages and makes available a variety of geoscientific data and provides public education and outreach services.

This document provides a summary of major activities undertaken during 2005. More detailed information and publications are available from the NTGO's web site at www.nwtgeoscience.ca.

NTGO geoscience activities are designed to contribute to the following goals: a prosperous, sustainable resource-based economy in the Northwest Territories; a significant contribution by the Northwest Territories to Canada's energy supply; and the informed use of geoscience information to underpin land use, land claims, and resource management policies and decisions.

The NTGO received a financial boost during the second half of 2005 from the federal government's Strategic Initiatives in Northern Economic Development when $2 million was awarded to the Government of the Northwest Territories' Department of Industry, Tourism and Investment for geoscience activities under the Targeted Investment Program. This increased level of funding allowed two new field-based projects to be initiated during the summer of 2005 and will support a number of projects in late 2005/early 2006.

Field-Based Projects

WOPMAY OROGEN BEDROCK MAPPING AND INTEGRATED STUDIES

This multi-year bedrock mapping project targets segments of the westernmost Slave Province, the adjacent Wopmay orogen hinterland, and the Great Bear magmatic zone. Mapping during 2005 within the northern half of the project area supported several B.Sc. thesis studies and a post-doctoral research project in uranium-lead geochronology. Northern and western regions of the project area will be mapped in 2006.

IOCG POTENTIAL OF THE GREAT BEAR MAGMATIC ZONE

In conjunction with the Wopmay project, detailed mapping and sampling were carried out within several areas of the Great Bear magmatic zone. The work involved detailed examination of known mineral showings and alteration assemblages that may indicate IOCG (iron oxide-copper-gold) mineralization. This is a collaborative project with the GSC and industry that will attempt to better define mineralogical, structural and geochemical criteria for targeting prospective areas. In fall 2005, a contract for an aeromagnetic survey was awarded for a portion of the magmatic zone for which no publicly available data exist. The survey will be completed by spring 2006.

MACKENZIE MOUNTAINS AIRBORNE GEOPHYSICS AND FIELD RECONNAISSANCE

A 100-km-long, northeast-trending corridor of airborne magnetic and radiometric data was acquired in partnership with the GSC near the Canol Trail, Mackenzie Mountains. This region is prospective for gold, base metals and gemstones. In conjunction with information from a one-week field reconnaissance and a regional examination of mineral showings, the data will be used to plan a multi-year bedrock mapping program starting in 2006. The project will focus on lithological and structural mapping, stratigraphy, and mineral potential.

HYDROCARBON POTENTIAL OF THE PEEL PLATEAU AND PLAIN

This was year one of a multi-year investigation of the basin architecture and petroleum potential of the Peel Plateau and Plain, a poorly known area lying within and west of the Mackenzie Valley. Reconnaissance field work and sampling were carried out this past summer in preparation for a full field season in 2006. The project is a joint venture between the NTGO, the GSC, and the Yukon Geological Survey.

MACKENZIE VALLEY PERMAFROST MONITORING PROJECT

A GSC scientist at the NTGO has begun a project to enhance the active layer and permafrost thermal monitoring network in the Mackenzie Valley. Additional monitoring sites will be established this winter to fill gaps in the existing network and provide baseline information in anticipation of future pipeline, highway, and power line development. The new sites will also contribute to the long-term monitoring of climate change.

EDEHZHIE (HORN PLATEAU) RESOURCE ASSESSMENT

A geochemical and heavy mineral concentrate survey of the Edehzie candidate protected area was completed during the summer of 2005. Data collected from both water and stream sediment samples will be used to assess the mineral potential of the region in advance of a final land-use decision.

NAHANNI MINERAL AND ENERGY RESOURCE ASSESSMENT

An NTGO geologist on secondment to the GSC assessed mineral showings within a proposed extension to the Nahanni National Park Reserve. GSC-led geochemical and geophysical surveys of the region were also carried out in 2005.

Data Management and Delivery

The NTGO continues to update its publicly available databases (e.g., NORMIN) and is currently enhancing its web-based publications and data delivery systems (e.g., Gateway). A major web project initiated in 2005 is the discovery of geological information via an interactive map interface. This will both replace and enhance the current NORMIN web application. The map interface will allow spatial queries and downloads, and will also link to NTGO databases.

Geomatics staff completed a major upgrade to the NTGO computer network during 2005. Support is ongoing for the production of digital geological atlases and digital field mapping using Pocket PCs.

Outreach/Education

The NTGO conducts a number of geoscience education activities throughout the Northwest Territories and also informs communities and the public about NTGO geoscience projects. The outreach program is currently growing. Some of the major activities described below were formally reviewed during 2005 to investigate ways to enhance program delivery.

PROSPECTOR'S GRUBSTAKE PROGRAM

The Prospector's Grubstake Program provides technical support and funding for Northwest Territories prospecting projects up to a current maximum of $8000 per individual per year. Eligibility to apply for the program is based on completion of an approved prospecting course or proof of previous prospecting work. Grubstake grants were awarded to seven prospectors during 2005. Additional information and application forms are available from the NTGO.

PROSPECTING WORKSHOPS AND COURSES

A community-based, 40-hour Introduction to Prospecting course is offered by the NTGO upon request. The course can be used to gain eligibility to the Prospector's Grubstake Program. Topics covered include basic rock and mineral identification, techniques of field work, and the mineral regulatory regime. School visits are commonly arranged while the rock and mineral displays used for the course are set up in the community.

Community Mapping

A two-week Community Mapping project was carried out in Tsiigehtchic during 2005. Community members investigated local bedrock and surficial geological features, cultural sites, and other points of interest. The project provided basic geological knowledge of the area, and a poster summarizing project highlights is being prepared with community members for their use (e.g., to support local tourism).

University of Alberta Field School

The University of Alberta's 2005 Northwest Territories field school was delivered in collaboration with the NTGO in the Taltson magmatic zone, 60 km north of Fort Smith. This year's course identified a number of previously unrecognized geologic features, including a crustal-scale shear zone of uncertain kinematic significance. The field work is being followed up by five undergraduate theses ranging from petrologic to geochronologic studies.

Client Services and Publications

Work continues on cataloguing the NTGO's library holdings for use by staff, prospectors, company geologists, visiting researchers, and the general public. Archived and recent company assessment reports are now available digitally and can be accessed via the Gateway portal at the NTGO's web site. A new publication series – Educational Publications – has been created for a non-geological

audience with content ranging from scientific to non-scientific. An updated geology map of the Northwest Territories showing the location of major mineral and petroleum resources is now available, as are updated posters on the petroleum geology of the Northwest Territories. Well reports from the National Energy Board are also available from the NTGO through the Gateway portal.

2.13 NUNAVUT[26]

Government of Nunavut

The Government of Nunavut (GN), through its Department of Economic Development and Transportation (ED&T), welcomes the interest and investment of sustainability-oriented mineral exploration and mining companies.

The Department envisages a vibrant and sustainable minerals industry based on the "triple bottom line" concept, where success in the industry is measured by: (1) the adherence to best environmental practices; (2) the sustained flow of benefits to local residents; and (3) the return of healthy profits to shareholders.

The past three field seasons have seen unprecedented levels of exploration undertaken in Nunavut. A number of quality discoveries have recently been made and there will be substantial opportunities to be realized in the territory as exploration continues and as exploration projects evolve into mines.

ED&T is working to ensure that all Nunavummiut are in a position to benefit from these coming opportunities and that they have the option of becoming full participants in developments in the territory.

At the same time, it is recognized that exploration and mining companies have the option of investing in many jurisdictions throughout the world. Therefore, ED&T is committed to working with its partners in Nunavut Tunngavik Inc. (NTI) and the federal government to make the legislation, policies and regulatory environment of Nunavut efficient, internationally competitive and attractive to investors.

Current Government of Nunavut initiatives include:

Nunavut Mineral Exploration and Mining Strategy

To collect and understand stakeholder views on a wide range of mining and exploration issues, ED&T carried out consultation meetings throughout the territory in 2005 with participation from Nunavummiut, Inuit organizations, institutions of public government, the Government of Canada, community governments, other GN departments, private Nunavut-based businesses, and Nunavut Arctic College. In addition, in southern Canada, meetings were held with representatives of the mining and exploration industries and environmental non-governmental organizations.

The views expressed in these consultations have been collated and form the basis of the Nunavut Mineral Exploration and Mining Strategy, which will be released in early 2006. This document will clarify the GN's position on mining and exploration, and will guide the government as it deals with the opportunities and challenges that development of the territory's mineral wealth will bring.

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[26] This overview is a combined effort of four partners: the Minerals and Petroleum Resources Division of the Government of Nunavut, the Mineral Resources Section of Indian and Northern Affairs Canada, the Lands and Resources Department of Nunavut Tunngavik Inc., and the Canada-Nunavut Geoscience Office. For more information, please contact David Smith by telephone at (867) 975-5914 or by e-mail at dsmith@gov.nu.ca.

Nunavut Prospectors' Program (NPP)

ED&T provides technical and financial assistance to Nunavummiut with demonstrated prospecting skills to carry out their own prospecting projects. While this program has been in existence since 1999, this year the amount of financial assistance available for each prospector has been increased from $5000 to $8000 per year.

Introductory Prospecting Course

Every year, ED&T geologists present a six-day Introductory Prospecting Course to interested residents in communities throughout the territory. Since 2000, the course has been offered in each community, with over 400 graduates to date. Graduates of the course often apply for NPP grants and are sought after as field assistants on mineral exploration programs.

Community Minerals Education and Training

ED&T works with many other stakeholders, including the Department of Education, the Government of Canada, and the mining and exploration industries on a number of programs designed to inform Nunavummiut of all ages of the opportunities in the mineral industries. ED&T programs and information include:

- Nunavut High School Math and Science Awards Program;
- Earth Sciences and Mining Teacher Workshops;
- Careers in Mining School and Community Presentations;
- Mineral exploration company contact list for communities; and
- Nunavut Science Outreach Network.

The Department maintains geology offices in Iqaluit, Arviat and Kugluktuk.

Land Tenure in Nunavut

In 1993, the largest Aboriginal land settlement in Canadian history was concluded through the Nunavut Land Claims Agreement (NLCA). The NLCA provided for the formation of the new territory of Nunavut on April 1, 1999, and provided many other rights to Inuit. Nunavut, which covers 1 994 000 km^2, comprises the eastern and northern portions of land previously referred to as the Keewatin and Franklin districts of the Northwest Territories. Nunavut's population approximates 27 000, 85% of which is of Inuit origin. A total of 27 communities are home to anywhere from 50 to 6000 people. Most communities offer a range of services (visit the Canada-Nunavut Community Business Service Centre web site at www.cbsc.org/nunavut), including regular scheduled air service. Several communities offer specific mining- and exploration-related services and are home to independent prospectors and others experienced in mineral exploration and mining.

In addition to the creation of the new territory, the NLCA gave Inuit fee simple title to 356 000 km^2 of land. There are 944 parcels (16% of Nunavut) of Inuit Owned Lands (IOL) where Inuit hold surface title only (Surface IOL). The Crown retains the mineral rights to these lands. Inuit also hold fee simple title, including mineral rights, to the remaining 150 parcels of IOL (Subsurface IOL), which total 38 000 km^2 and represent approximately 2% of the territory. Surface title to all IOL is held in each region by one of the three Regional Inuit Associations (RIAs) while Inuit subsurface title with respect to Subsurface IOL is held and administered by Nunavut Tunngavik Incorporated (NTI). NTI issues rights to explore and mine through its own mineral tenure regime. Mineral rights (mineral claims or leases) that existed at the time of the signing of the NLCA – known as grandfathered rights – continue to be administered by Indian and Northern Affairs Canada (INAC) until they terminate or the holder transfers its interests to the NTI regime. For both Surface and Subsurface IOL, access to the land, through a Land Use Licence or Commercial Lease, must be obtained from the appropriate Regional Inuit Association.

The Crown owns mineral rights to 98% of Nunavut. INAC administers rights through the Canada Mining Regulations (CMR). This includes Surface IOL for which access to the land must nevertheless be obtained from the RIA as explained above.

Significantly, the NLCA is a final settlement whereby all land claims in Nunavut have been settled with the Inuit of Nunavut, thus providing an unmatched level of land tenure certainty. However, land claims overlapping Hudson Bay and the southernmost Kivalliq are being negotiated with residents of northern Québec and northern Manitoba, respectively.

Indian and Northern Affairs Canada (INAC)

Indian and Northern Affairs Canada (INAC) administers mineral tenure on Crown land in Nunavut through the Mineral Resources Section and the Mining Recorder's Office (Iqaluit). Staff from the Mineral Resources Section review assessment reports filed under the Canada Mining Regulations (CMR) and carry out property visits to explorations projects. The Mining Recorder's Office administers all other aspects of mineral tenure.

Other activities supported by the Mineral Resources Section include:

- Partner in the Canada-Nunavut Geoscience Office (C-NGO) together with Natural Resources Canada and the Government of Nunavut;
- Participation in environmental reviews providing technical advice and perspective;
- Maintenance of a digital archive of assessment data filed in Nunavut dating back to the 1940s;
- Maintenance of a library of reference materials, rock samples and press clippings;
- Promotion of Nunavut through community outreach, publications and professional networking; and
- The undertaking of targeted geoscience in conjunction with the C-NGO or industry.

The year 2005 was another busy year for prospecting permits, resulting in the permitting of the largest area of Crown land in the history of Nunavut. A total of 1136 prospecting permits encompassing 48 million hectares (Mha) were granted by the Mining Recorder's Office in 2005.

While the main commodity being explored for is diamonds, exploration for precious and base metals is still strong, due in part to increasing market prices. The recent increase in the price of uranium has reinvigorated the search for this commodity as well.

Canada-Nunavut Geoscience Office

The Canada-Nunavut Geoscience Office (C-NGO) is a partnership between the Geological Survey of Canada (GSC), INAC, and the Government of Nunavut (Department of Economic Development and Transportation). The mandate of the C-NGO is to provide accessible geoscience information and expertise in Nunavut in support of sustainable development of mineral and energy resources, informed land-use decision-making, geoscience education, and capacity building. In 2005, the C-NGO participated in field-based geoscience projects, provided GIS, cartographic and Remote Predictive Mapping (RPM) support and services, and contributed to public outreach activities.

C-NGO Projects

C-NGO projects are anticipated to improve the quality of life for Nunavut residents by allowing them to derive economic and social benefits resulting from the responsible development of mineral and energy resources in Nunavut. The purpose of each project is to reduce investment risk for mineral and energy exploration companies and increase and/or sustain current levels of exploration in the regions studied and reported on. Projects are designed to make a significant contribution to the geoscience knowledge base of Nunavut and address a critical knowledge gap in the current geoscience database. The projects are multi-faceted and may consist of components of ground-based

field activities, including mapping bedrock and surficial geology; geophysical, geochemical and geochronological surveys; and comprehensive data compilation activities. In addition, the field-based projects include components of community consultations and public outreach activities.

NORTH BAFFIN PROJECT (SURFICIAL GEOLOGY, QUARTERNARY HISTORY AND PROSPECTING)

In 2005, the C-NGO, in collaboration with the GSC, the University of Alberta, and Dalhousie University, expanded the 2003 North Baffin project from Ice Bound Lakes (NTS map sheet 37G) to Conn Lake (NTS 37E) and south Buchan Gulf (NTS 37H/South). The study area lies along the northeast coast of Baffin Island between Bylot Island and the Clyde foreland, areas with contrasting ice sheet reconstructions and chronologies. The study area provides an opportunity to resolve critical issues and will have significant implications for regional drift prospecting programs.

The primary goal of the project is to reduce mineral exploration risk in the northeast Baffin Island region by improving the existing geoscience knowledge base. The project involves mapping the surficial geology at a 1:100 000 scale, as well as collection of drift, stream and bedrock samples, and detailed bedrock mapping of key localities. In 2005, more than 300 samples were collected for till geochemistry and kimberlite indicator minerals (KIM) analyses, 31 stream sediment samples were collected for geochemistry and KIM analyses, more than 100 bedrock samples were collected for assay, and 90 samples were collected for lithogeochemical analyses. In addition, the project collected data for about 1400 "ground-truthing" sites as part of the ongoing development of an RPM protocol, 314 paleo-ice movement measurements, 27 cosmogenic samples, and 41 radiocarbon samples for geochronology; research was also conducted into glacial dynamics influencing the surficial geology of the region.

BOOTHIA MAINLAND PROJECT (BEDROCK AND SURFICIAL GEOLOGY)

A multi-year geoscience program focusing on the Boothia Mainland area, and including parts of NTS map sheets 57A, 57B and 57C, was launched in 2005. Field work in the 2005 field season included 1:250 000-scale bedrock mapping in addition to local, detailed surficial mapping and ice-flow studies. The mapping follows acquisition of an aeromagnetic survey completed in March 2005 (released April 2005). In advance of the field work, a comprehensive Remote Predictive Map for the region was produced, which assisted in developing a more strategic approach to bedrock mapping. The region has significant exploration potential for diamond and precious-metal deposits.

GRANULAR AGGREGATE RESOURCE ASSESSMENT PROJECT

A supply of high-quality granular aggregate is vital to meet the infrastructure requirements of any community or construction project. In 2005, an assessment of potential granular aggregate resources was carried out in the area around the city of Iqaluit. The survey was required because of resource depletion and environmental concerns at the existing source of granular aggregate for Iqaluit. The 2005 survey also developed a protocol that can be applied towards future aggregate assessment projects in Nunavut.

Nunavut Tunngavik Incorporated

Nunavut Tunngavik Incorporated (NTI) is the Inuit corporation responsible for overseeing implementation of the NLCA. NTI's mandate includes safeguarding, administering and advancing the rights and benefits of the Inuit of Nunavut to promote their economic, social and cultural well-being through succeeding generations. The Lands and Resources Department of NTI is responsible for the implementation of Inuit responsibilities related to the management of Inuit Owned Lands (IOL), the environment, minerals, oil and gas, and marine areas.

There are two forms of mineral tenure that grant exclusive rights on Subsurface IOL administered by NTI. These are the Inuit Owned Lands Mineral Exploration Agreement (usually referred to as the

"Exploration Agreement" or "EA") and the Inuit Owned Lands Mineral Production Lease (referred to as the "Production Lease"). The Exploration Agreement grants a company or individual the exclusive right to explore and prospect for minerals (excluding oil and gas, and specified substances such as construction materials and carving stone) on a portion of Subsurface IOL. This area, referred to as the Exploration Area, is similar in many ways to a mineral claim under the CMR.

The Production Lease grants the holder of an Exploration Agreement the right to produce minerals from a portion of the Exploration Area known as the Production Lease Area.

Since 1999, NTI has had in place a system of application that does not require staking when applying for an Exploration Agreement. Rather, the application requires only a description of the Exploration Area based on latitude and longitude. The applicant must submit to NTI a completed application form entitled Application for an Inuit Owned Lands Mineral Exploration Agreement (available on request from NTI or from the Lands Department web site). The completed application includes a description of the proposed Exploration Area defined by latitude and longitude of the boundaries and a map showing the proposed Exploration Area. Applications are received during designated months and are processed at the start of the subsequent month, at which time NTI will decide whether to accept an application and issue an Exploration Agreement. Applications are kept confidential until the close of the application period in which they are received, thus ensuring that all applicants are treated fairly. Further details on the application process are included in the application form.

It should be noted that although the process and documents described here normally apply, NTI, as a private organization, has complete discretion on whether it will issue an Exploration Agreement (or other agreement), what the process will be for obtaining an agreement, and what the terms of the agreement will be. The terms may include, for example, NTI holding a direct interest in a project.

Under the standard terms, successful applicants, upon executing the new Exploration Agreement and submitting the first year's annual fees, will be granted the exclusive right to explore for minerals on the Exploration Area. In order to gain access to the land, however, the applicant must obtain a surface right issued by the RIA.

NTI currently has 54 active Exploration Agreements with prospectors and exploration and mining companies. These cover more than 12% of the total Subsurface IOL. (In addition, grandfathered claims and leases comprise approximately 2% of all subsurface IOL.)

Holders of Exploration Agreements are required to submit annual exploration work reports to NTI that remain confidential for a period of up to three years

Many of the advanced exploration projects in Nunavut fall on Subsurface IOL.

Summary of Exploration Activities, 2005

Qikiqtani/Baffin Region

In the Qikiqtani/Baffin Region, exploration has been increasing significantly each year for the last four years. The main focus of exploration in the Qikiqtani/Baffin Region is on diamonds. The northwestern half of Baffin Island and Melville Peninsula have been the main hub of diamond exploration in the Qikiqtani Region, although De Beers and Stornoway are pushing diamond exploration into the High Arctic.

There is a wide range of commodities, other than diamonds, being sought in the Qikiqtani region; these include sapphires, iron, gold, silver and coal.

AVIAT PROJECT

The Aviat project (Stornoway Diamond Corp., BHP Billiton Diamonds Inc., and Hunter Exploration Group) is located on the Melville Peninsula. It consists of 5.5 million acres of prospecting permits and claims. Stornoway Diamond Corp. is the operator and carries a 70% interest in the property. The first kimberlite, Aviat 1, was discovered by the Hunter Exploration Group in 2001 and optioned to Northern Empire Minerals and Stornoway Ventures Ltd. These two companies combined in July 2003 to form Stornoway Diamond Corp. In the same month, BHP bought a 20% share in the Aviat property from the Hunter Group. The Hunter Group carries a 10% interest in the Aviat property.

The Aviat 2 kimberlite was discovered in the summer of 2003 and Aviat 3, 4 and 5 were discovered in the summer of 2004. Aviat 6, 7 and 8 were discovered during the 2005 field season. To date, Aviat 1 through Aviat 6 and Aviat 8 have been confirmed by drilling. Aviat 7 was not drilled because of its proximity to a lake. Aviat 1 through Aviat 8 have been shown to be diamondiferous. Aviat 1, from a mini-bulk sample of 7.4 t, has yielded a grade of 0.88 ct/t.

This year's work on the Aviat property started in the spring of 2005 with lake-based drilling and geophysics. Fifty-three grids were surveyed by ground geophysics and 15 geophysical targets were drilled, although no kimberlite was intersected. As the season progressed, the six known kimberlite occurrences in the main corridor were drilled, including Aviat 1, which was extended by 170 m to the west with one drillhole.

The summer field work started in July and, by the end of the season, three new kimberlite bodies (Aviat 6, 7 and 8) had been discovered through prospecting. Twenty-nine holes were drilled during the summer to test the newly discovered kimberlite bodies, with the exception of Aviat 7. Core and grab samples from Aviat 6, 7 and 8 were tested through caustic fusion and all three were found to be diamondiferous. Two tonnes of kimberlite have been collected from Aviat 6, 7 and 8 and will be tested via caustic fusion. Other work performed during the 2005 season included: the collection of 3100 till samples in 19 priority areas outside known kimberlite indicator minerals (KIM) trains; and prospecting, which has found 350 kimberlite boulder locations that may represent five new KIM trains.

WALES ISLAND PROJECT

The Wales Island project is owned by Stornoway Diamond Corp., Strongbow Exploration Inc., and BHP Billiton Diamonds Inc. The project's exploration permits on Wales Island, located in Committee Bay, were granted in February 2003. An airborne geophysical survey was flown during the 2003 field season and identified a series of targets. Two of these targets were drilled in 2004, resulting in the discovery of two kimberlite bodies. In 2005, work on Wales Island started in August and included drilling, ground geophysics and till sampling. Eight new kimberlite bodies were discovered, five through diamond drilling and three through prospecting, bringing the total to 10 kimberlite bodies discovered on Wales Island. Work performed in the 2005 season included 19 drillholes (1366 m), ground geophysics over 20 targets, and 61 till samples. As a result of this work, 708 kg of drill core and 70 kg of outcrop material will be tested for diamonds by caustic fusion.

JACKSON INLET PROPERTY

The Jackson Inlet property is owned by Twin Mining Corporation and Stornoway Diamonds Corp. Diamond exploration on northern Baffin Island dates back to the early 1970s, when Diapros and Cominco discovered kimberlites on both the Brodeur Peninsula and Somerset Island. A second phase of exploration began shortly after the diamond rush arose in the Northwest Territories, with Lumina Investment and Cyclone Capital conducting work in the region. Twin Mining Corporation acquired the property from privately held Helix Resources in June 2000.

Since acquiring the property in 2000, Twin Mining has added substantially to its land holdings on the Brodeur Peninsula and has at least four kimberlite bodies, including Freightrain.

During the summer of 2004, Twin Mining outlined 42 anomalies through airborne geophysical surveys on the Jackson Inlet East property. Eighteen of the anomalies were considered significant and crossed up to five flight lines (250 m). On the Jackson Inlet West property, seven anomalies that crossed five flight lines were outlined in the same survey. Core and mini-bulk samples collected since the acquisition of the property have demonstrated significant diamond content.

The exploration program in 2005 consisted of 14 754 line-km of airborne gradiometer survey, minor till sampling and reverse circulation drilling. The drilling program was designed to investigate the presence and quality of kimberlites on the Jackson Inlet property. Reverse circulation drilling tested the Freightrain kimberlite with 3 holes, the Cargo 1 kimberlite with 7 holes, and 14 aeromagnetic anomalies with 20 holes. At the time of writing, no results were available.

OZ CLAIMS

In May 2005, Diamondex Resources Ltd. announced that it had signed a letter of intent to acquire a 100% interest in Kennecott Canada Exploration Inc.'s Oz claims and prospecting permits on the Brodeur Peninsula of Baffin Island.

Kennecott had discovered three diamondiferous kimberlite bodies on the property: Tuwawi, Nanuk, and Kuuraq. The Tuwawi kimberlite is the largest of the three (250 m x 150 m). The Tuwawi kimberlite was drilled and produced 1520 kg of drill core as a mini-bulk sample. Three hundred and nineteen diamonds were recovered from this sample and showed a coarse diamond distribution similar to Twin Mining's Freightrain kimberlite. Little information has been released about the other two kimberlites.

During the field season, Diamondex flew 21 225 line-km of fixed-wing magnetic surveys and 2800 line-km of Fugro Resolve airborne surveys over previously identified airborne magnetic targets.

Diamondex also collected 661 till and stream samples and recovered several kimberlite float boulders up to 30 cm in diameter. The boulders were found down ice from several airborne geophysical targets. Diamondex has allocated $800 000 to drill the newly defined geophysical targets. To date, Kennecott and Diamondex have spent $9.5 million on the Brodeur project area.

QUIMIQ PROJECT

The Quimiq project (Commander Resources Ltd., BHP Billiton, Falconbridge Limited, and Nunavut Tunngavik Inc.) is located within the Piling Group, a lower Proterozoic supracrustal assemblage that is part of the Foxe Fold Belt, the northern extent of the Trans-Hudson Orogen that stretches from Melville Peninsula to the west coast of Greenland. The southern margin of the Piling Group comprises a diverse lower package of siliciclastics, volcanic flows and volcaniclastics, and an upper succession of greywacke-turbidites. The area is considered prospective for Broken Hill-type, volcaning massive sulphides (VMS) and mesothermal gold deposits.

BHP Billiton and Falconbridge received prospecting permits covering the south margin of the Piling Group in 2000. BHP Billiton also obtained 10 NTI leases covering the IOL in the area. Under an agreement signed in 2003, Commander Resources can earn a 100% interest in the gold rights to the property by spending $10.2 million on BHP Billiton's permits by the end of 2012 and by spending $8.0 million on the Falconbridge permits by the end of 2011.

Exploration in 2004 was concentrated in the Malrok Lake (local name) area where drilling and surface sampling recovered significant although discontinuous gold values in the iron formations. The silicate iron formation is very similar in the style of mineralogy and mineralization to the Musselwhite mine in northwestern Ontario and the Homestake mine in South Dakota.

In spring 2005, the camp was moved westward to the Dewar Lake area. Exploration was concentrated in the Ridge Lake area and on the Durette prospect.

At the Durette prospect, chip and channel sampling during the 2005 field season outlined a zone 500 m in strike length and open in all directions. The best samples collected and assayed at the Durette prospect were 28.9 g/t gold over 2.0 m and 18.0 g/t gold over 2.0 m. The mineralization, a quartz stockwork with arsenopyrite-pyrrhotite, is above the iron formations and seems to be hosted in a strong east-west structure that is coincident with a strong electromagnetic (EM) conductor. Commander Resources indicates that drilling will take place on the Durette showing next season.

The Ridge Lake prospect is a structurally thickened sheared and mineralized iron formation, and may be part of the structure hosting the Durette prospect. This season, diamond drilling at Ridge Lake has revealed a zone 600 m long in the Lower (sulphide facies) iron formation. The best intersection was 21.3 g/t gold over 4.24 m. The mineralization intersected while drilling the Lower iron formation seems to correlate with surface showings. The showing is open in all directions at this time.

QILALUGAQ PROJECT

BHP Billiton's Qilalugaq project consists of 405 mining claims on the southwest end of the Melville Peninsula. The property lies between Repulse Bay in the south and Committee Bay to the northwest. Work on the property started in the area in 2000. In 2004, a 45-person camp was established approximately 8 km from the Hamlet of Repulse Bay.

To date, a cluster of nine kimberlite bodies has been reported on the Qilalugaq property. One of the kimberlite bodies (Qilalugaq) warranted a mini-bulk sample and 9.37 t of material was sampled and produced a grade of 0.25 ct/t. This grade was sufficient to warrant a larger bulk sample, which was extracted using a reverse circulation drill. A 237-t bulk sample was collected and, at the time of writing, results were still pending. The Qilalugaq kimberlite may be a composite body composed of up to four separate intrusions.

In May 2005, BHP Billiton completed a 10-hole drill program. No results were available at the time of writing. During the summer, the camp was disassembled and it will be demobilized during the winter of 2005/06.

BORDEN PROJECT

In 2003, Patrician Diamonds Inc. staked a package of claims (88 000 acres) 90 km south of Arctic Bay on the Borden Peninsula. Kimberlite bodies were discovered on the property during staking in the spring of 2003. During preliminary field work in the summer of 2004, angular kimberlite float was found in three separate locations and caustic fusion recovered five diamonds from 162 kg of kimberlitic material, the largest diamond being 0.31 ct.

In June 2005, Patrician Diamonds Inc. contracted McPhar Geosurveys Ltd. to carry out a high-resolution airborne magnetic survey over its Borden Peninsula property. Approximately 3700 line-km were flown in August 2005. Preliminary results were received in September. The data showed a number of magnetic features of high interest that occurred in proximity to strongly anomalous kimberlite indicator mineral concentrations in stream sediments. Because of the lateness of the season, no follow-up of the airborne results was done. These targets will be a priority for evaluation during the 2006 field season.

MARY RIVER IRON PROJECT

The iron deposits at the Mary River on north-central Baffin Island were first discovered by Murry Watts and Ron Sheardown in 1962. Between 1963 and 1965, exploration work took place on the claims and five high-grade iron deposits were identified. Most of the exploration work was per-

formed on the No.1 deposit, including 3319 m of core drilling and the tracing of the iron formations through airborne and ground geophysics, geological mapping, and trench sampling of each of the identified deposits. A bulk sample was also taken for metallurgical testing.

The property remained dormant until 2004 when Glimmer Resources Inc. and Baffinland Iron Mines Ltd. combined to form Baffinland Iron Mines Corp.

The drilling of the No. 1 deposit in 2005 was designed to in-fill the drilling done in 2004 within approximately one kilometre of the axis of the fold between the south and north limbs of the deposit, and to step out at depth in certain areas. The widely spaced 2004 program had been successful in more than doubling the drill-indicated strike length delineated in the 1960s to about 2.5 km, more than doubling the depth of the No. 1 deposit and adding substantially to the thickness of the deposit with the discovery of an upper zone. The 2005 program extended the depth of the No. 1 deposit to more than 450 m on the north limb.

BELUGA SAPPHIRE PROJECT

The sapphires discovered near Kimmirut on southern Baffin Island are hosted in a desilicified syenitic pegmatite lens in the marbles of the Lake Harbour Group. The claims were staked in 2002/03 by Nowdla Aqpik and his brother Seemeega. In November 2003, True North Gems Inc. optioned the Beluga sapphire occurrence from the Aqpiks. At that time, there were two known occurrences of sapphires on the claims.

In 2004, True North Gems recovered a 4.29-t bulk sample from the main sapphire deposit (the Beluga) and discovered four additional sapphire occurrences on the property for a total of six occurrences. Along with the bulk sample, True North Gems conducted regional till sampling and prospecting programs in 2004. The results of the bulk sample were very encouraging with the recovery of rough sapphires from the 2004 bulk sample standing at 790.7 g/t. The grade of gem-quality and near-gem-quality sapphires was 33.1 g/t and 115.0 g/t, respectively. An independent evaluation of a portion of the sapphires that were processed showed an average value of US$570.85/t. The deposit has to date produced natural blue, yellow and colourless sapphires.

In 2005, True North Gems continued with exploration on the Beluga sapphire occurrence. Work included the extraction of approximately 110 t of sapphire-bearing material from the Beluga occurrence, detailed mapping, and prospecting of the claims. No results from the bulk sample were available at the time of writing. In November, True North Gems announced the discovery of a new sapphire occurrence, the Aqpik occurrence. The sapphire is colourless and gem quality, with the largest piece recovered being 49 ct. True North Gems believes the Aqpik occurrence is a new style of sapphire mineralization within the same unit that hosts the other sapphire occurrences.

BAFFIN ISLAND PROPERTY

De Beers Canada Inc. has been exploring for diamonds on Baffin Island since 2001 and has performed extensive till and stream sampling, ground and airborne geophysics, reverse circulation drilling, and diamond drilling. In 2004, it was reported that De Beers had been following a kimberlite indicator mineral (KIM) train and had found a kimberlite float train coincident with the KIM train.

Work on Baffin Island during the 2005 field season included glacial striation mapping and kimberlite float prospecting, 1454 m of drilling, and 6547 line-km of AeroTem survey and 23 line-km of ground gravity surveys over two grids. The kimberlite float prospecting produced 604 individual pieces of float, which suggests multiple sources may be present on the property. The drilling intersected several sheet-like kimberlite bodies at the head of the kimberlite float train. No results on the diamond content of the kimberlites were available at the time of writing.

Kivalliq District

The Kivalliq District includes the eastern mainland, Southampton Island, and several smaller islands. The communities of Rankin Inlet, Baker Lake, and Arviat are often used as staging points for exploration projects. Scheduled and charter air services, expediting services, and other supporting businesses are available in these centres.

Rocks of the Archean-Proterozoic Western Churchill geological province underlay much of the Kivalliq District. Sedimentary rocks of the Hudson Platform are found on islands within Hudson Bay. Past-producing mines in the District are the North Rankin nickel mine at Rankin Inlet and the Cullaton/Shear Lake gold mine north of Nueltin Lake.

More than 35 exploration projects were active in 2005 targeting a wide range of commodities, including gold, diamonds, nickel-copper-platinum group elements (PGE), base metals, and uranium. Current exploration targets include lode and iron-formation-hosted gold, epithermal gold, quartz-pebble-conglomerate-hosted gold, mafic-ultramafic nickel-copper-PGE deposits, diamondiferous kimberlites, unconformity-associated uranium, iron oxide-copper-gold (IOCG) and VMS mineralization.

Gold and diamonds were the leading commodities sought in 2005 in the Kivalliq District while exploration work for uranium in the area was limited to airborne geophysics, mapping, prospecting, and community consultations. The Thelon Basin is relatively under-explored and it has not yet been prospected using modern technologies. Historic uranium exploration work was mostly reconnaissance work done in the boom years of the 1970s and 1980s.

COMMITTEE BAY PROJECT

The Committee Bay Greenstone Belt is one of the largest unexplored greenstone belts in North America. The 300-km-long, northeast-trending belt comprises Archean supracrustal rocks of the Rae domain in the Western Churchill Province. Rock types include komatiitic to basaltic volcanic rocks, intermediate to felsic rocks, and banded iron formation.

Committee Bay Resources Ltd., together with its joint-venture partner Gold Fields Guernsey Limited, currently holds 0.65 Mha along the belt. The company's $8 million 2005 exploration program included 5000 line-km of airborne geophysical (EM and magnetic) surveys, detailed gridding and ground magnetic surveying over high-priority targets, and drill testing of the Raven and Three Bluffs zones. Drilling at Three Bluffs was intended to test shallow targets along strike, as well as deeper targets beneath the reported inferred resource delineated in 2004. Initial drill testing of several other prospects, including Raven, West Plains and Betwixt, was also completed.

Prior to the 2005 drill program, a near-surface high-grade inferred mineral resource of 1.9 Mt grading 8.0 g/t gold for 487 000 contained oz had been defined by 49 drillholes at Three Bluffs. Using a lower cut-off grade, this inferred mineral resource was expanded to 5.1 Mt grading 4.0 g/t gold for 657 000 oz. About 85% of these resources are within 120 m of surface and the bulk of the high-grade gold mineralization is along a shallow-plunging structure.

The company's 2005 drill program at Three Bluffs was successful in tracing the high-grade gold mineralization to depths in excess of 320 m over a strike length of 600 m. A number of intersections with visible gold did not return high assay values. The company states this reflects the nuggety effects of the gold distribution at Three Bluffs. Spring drilling at the Raven occurrence (20 km west of Three Bluffs) encountered two mineralized zones. These zones are characterized by multiple quartz veins with abundant visible gold, euhedral arsenopyrite and minor pyrrhotite over widths of 2 m to 10 m concentrated along the sheared contact of a gabbro with intermediate volcanics. Assays reported from the South zone are 12.6 g/t gold over a 5.46-m core length and 36.22 g/t gold over a 2.43-m core length.

For 2006, the company is planning more work at Three Bluffs and further evaluation of the targets defined through surface sampling. Three Bluffs work will include in-fill and deeper drilling along the high-grade trend designed to expand the gold resource and a ground geophysical program along strike of the resource area.

CHURCHILL DIAMOND PROJECT

The Churchill diamond project (Shear Minerals Ltd., Stornoway Diamond Corp., and BHP Billiton Diamonds Inc.) is comprised of mineral rights to more than 3.64 Mha located near the communities of Rankin Inlet and Chesterfield Inlet.

Shear Minerals discovered 17 kimberlites in 2005 before completing its 52-hole drill program. This brings the total number of kimberlites drilled on the property to 39. In addition, two kimberlite outcrops were located in 2005 through groundwork and prospecting. The 2005 drill program started in April and continued through to the end of September with 4631 m of drilling testing 44 spatially separate geophysical targets. Final processing of the 2004 till samples was completed in mid-2005. Indicator mineral counts from detailed till sampling continued to refine areas of interest within the larger mineral corridors: Josephine, Sedna and North. Ground prospecting was conducted within the Josephine River and Sedna kimberlite-indicator-minerals corridors covering an area in excess of 75 km^2. A total of 30 kimberlite boulders were recovered. These include two occurrences of kimberlite float with visible pyropes and coarse-grained macrocrystic olivine textures. Macro and microdiamonds were reported from analysis of drill core and surface samples.

Drill-tested kimberlites 05KD900-01 and 05KD209-01 yielded macrodiamonds from initial caustic fusion analysis. The first diamond at surface, a clear octahedron (measuring 0.44 mm by 0.40 mm by 0.36 mm), was recovered in a 69.8-kg sample of pyrope garnet-bearing beach sands.

In 2005, a total of 1877 till samples were collected on the Churchill property in order to in-fill the sampling density in the core areas of the property and to better define the indicator mineral trains and the up-ice cut-off. Since 2000, more than 7100 surface samples have been collected from the property and all have been processed with more than 55 000 microprobe analyses. This sampling continues to refine the source areas of interest for future drilling.

A recent report for Shear Minerals by Mineral Services Canada Inc. used advanced indicator mineral composition techniques to filter the Churchill diamond project database. The results were incorporated in the selection of 2005 drill targets and detailed sampling plans. Mineral Services reports the known kimberlites discovered in the last two years did not explain the pyropes in till samples. Based on its findings, the unexplained till garnets, which include most G10s recovered to date, are very likely derived from a colder, high-interest geotherm (37 milliWatts per square metre [mW/m^2]) than garnets in the kimberlites identified on the property to date. Mineral Services identified 16 targeted areas that host high-interest garnet populations with above-average counts that indicate that source is likely nearby.

FERGUSON LAKE PROJECT

The 2005 drill program will bring the total drilling to date on this property, owned by Starfield Resources Inc. and first acquired in 1999, to approximately 108 000 m. During 2005, Starfield increased the size of its Ferguson Lake mineral claim holdings by 200% to 521 400 ha.

The Ferguson Lake deposit is a nickel-copper-PGE deposit hosted by moderate to weakly foliated tholeiitic gabbro-hornblendite layered intrusions. The deposits are considered to be of magmatic origin; the sills were emplaced along an east-west-trending structure interpreted by Starfield personnel as a regional suture based on three-dimensional magnetic inversion. Gabbro hosting the copper-nickel-PGE mineralization is exposed for 1.8 km along strike on the West zone.

Starfield followed up its 2004 airborne geophysical survey with a regional 9624-line-km helicopter VTEM and high-resolution magnetic survey flown over 60% of the newly staked claims. The survey identified numerous conductive anomalies within 450 m of the surface. Ground crews prospected and sampled outcrops along nine conductive VTEM trends having strike lengths of 2 km to 8 km. Analyses of rock samples along these trends show that they are geochemically anomalous in copper plus silver, copper plus nickel plus cobalt, copper plus zinc plus lead plus silver, and gold plus silver. Starfield's geophysical consultant identified 250 anomalies for follow-up as potential kimberlite targets. Regional till samples were collected on 2-km by 2-km and 4-km by 4-km grids across the entire property.

Delineation drilling of the West zone and 119 zone continued to intersect copper-nickel-PGE mineralization and low-sulphide PGE mineralization. So far, a strike length of 4.2 km (from the west side of Ferguson lake to the 119 zone) along a ground geophysical conductor coincident with the mineralization has been tested. An additional 3.8 km remains untested. Drilling continued to encounter the low-sulphide PGE-enriched horizons and a lower PGE-enriched sulphide lens(es). To date in the Pit area of the West zone, drilling along a 1-km strike length has traced the footwall PGE mineralization, with intermittent low-sulphide bonanza grades of platinum plus palladium and/or lower footwall sulphide lens mineralization. For 2006, Starfield plans to continue its exploration and development plan, including continuing environmental and site development studies, metallurgical testing and resource evaluation.

MEADOWBANK PROJECT

The Meadowbank gold deposits occur within the Archean Woodburn Lake greenstone belt, approximately 75 km north of Baker Lake, and represent the third largest undeveloped gold resource in Canada. The stratigraphy consists of quartzite overlying komatiite, which in turn overlies intercalated felsic to intermediate volcanic rocks and iron formation. Regionally, four phases of deformation are recognized. The stratigraphy is folded into a northwest-trending, isoclinal, recumbent anticline sandwiched between two large granitoid intrusions. Mineralization is hosted by interbedded iron formation and felsic to intermediate tuff with subordinate orthoquartzite and ultramafic schist. Sulphides (pyrrhotite and pyrite) and gold occur within a structural fabric associated with early progressive isoclinal folding. Alteration includes sericitization, sulphidation, silicification and carbonatization.

Cumberland Resources Ltd. continues to advance its Meadowbank project towards open-pit production. Six near-surface gold deposits have been identified in the project area: Goose Island, Third Portage and North Portage, Vault, Bay zone, and PDF. The Connector zone links the Third and North Portage deposits (these three zones are collectively termed the Portage zone). In early 2005, updated resource figures were released as part of a feasibility study. Based on open-pit mining methods, measured and indicated gold resources stood at 23.3 Mt grading 4.4 g/t, for 3.3 million contained oz, from the Portage, Goose Island and Vault zones.

The 2005 exploration program consists of a two-phased program, including a planned 9000-m diamond-drilling program and grass-roots exploration along the 25-km Meadowbank gold trend. The company completed geotechnical studies, in-fill drilling to increase gold reserves and resources at the Goose Island and Portage proposed pit areas and some grass-roots exploration; it also continued its environmental baseline studies and impact assessments.

Drilling on the northern and southern flanks of the Goose Island deposit returned mineralized intersections that are expected to increase the quality and size of the Goose Island reserves and resources. Mineralized intercepts on the southern flank occur over better-than-expected widths (3.2 g/t up to 10.97 g/t over 2.48 m to 9.13 m). Six of 11 holes drilled on the northern flank are expected to extend the deposit 50 m to the north. Two other holes returned grades of 10.09 g/t over 1.79 m and 14.90 g/t over 1.90 m at depths of 22 m and 19 m below surface.

Summer drilling discovered a new near-surface zone, the Cannu gold zone, 350 m north of the company's planned Portage Pit. Assay highlights include: 21.36 g/t gold over 1.75 m at 72 m below surface, 9.49 g/t gold over 3.12 m at 100 m below surface, and 7.06 g/t gold over 7.44 m at 28 m below surface. The new zone is along trend of the Portage and Goose Island reserves. It may contribute to increasing the resource and reserves of the project.

MELIADINE WEST

The Meliadine West deposits (Comaplex Minerals Corp. and Cumberland Resources Ltd.) are hosted within the Archean Rankin Inlet Group in the hanging wall of the Pyke Break deformation zone. Stratigraphy in the area strikes east-southeast and is overturned with south-facing tops. From north to south (oldest to youngest), the stratigraphy includes the Sam Formation (metaturbidites), Upper Oxide Formation, and Tiriganiaq Formation wackes and siltstones. These structurally overlie, but stratigraphically underlie, Wolf-Wesmeg formation mafic and ultramafic rocks with the interlayered Lean and Lower Lean iron formations and the Falcon formation variolitic flows. South of the Pyke Break, Sandhill formation siltstones and wackes, and Sic Sic formation polymictic conglomerate, are the dominant rock types.

The largest mineral resource on the Meliadine West property is the Tiriganiaq zone. Gold mineralization in the zone is found in quartz-vein stock works, laminated veins and sulphidized iron formation in complexly folded and sheared iron formation, and sedimentary and volcanic rocks. Gold is associated with quartz-ankerite veins; variable pyrrhotite; coarse-grained, euhedral arsenopyrite; and sericite alteration.

Early in 2005, Comaplex released a new resource figure based on an underground, narrow high-grade mining scenario for the Tiriganiaq zone, capped high gold assays at 60 g/t, and increased the cut-off grades for load definition. Tiriganiaq Main contains an indicated resource of 2 467 000 t grading 10.8 g/t gold (853 000 contained oz) and an inferred resource of 417 000 t grading 12.7 g/t gold. The West zone contains an inferred resource of 725 000 t grading 13.43 g/t gold. Total contained gold in all categories amounts to 1 335 000 oz.

In December 2004, Gold Fields Limited announced the purchase of an 11.4% interest in Comaplex in an open market transaction. The companies entered into a further private placement agreement in March 2005, whereby Orogen Holdings Limited, an indirect wholly owned subsidary of Gold Fields Limited, purchased 2 428 571 shares at a price of $3.50/share for aggregate gross proceeds to Comaplex of $8.5 million. On closing of this transaction, Orogen (GoldFields) increased its ownership to 7 628 571 shares of Comaplex, representing 19.8% of issued and outstanding shares in the company. The companies also entered into a technical assistance program whereby Gold Fields will second geological staff and provide engineering consultation on the Meliadine West project.

The 2005 drill program finished in September. A total of 15 851 m in 48 drillholes was completed. Of that total, 18 holes totaling 11 333 m (72%) were completed on the Western Deeps portion of the Tiriganiaq deposit, 3 holes totaling 1122 m (7%) were completed on the main deposit, and the remaining 20% was completed on reconnaissance regional targets (2083 m [13%] on shallow targets within 3 km of the deposit and 946 m [6%] on two widely spaced assessment targets).

Drill testing of mineralization in the Western Deeps intersected the gold-bearing structure at 575 m vertically below surface assaying 13.4 g/t gold over 3.3 m. The tenure of gold values from intersections in the 1000 zone of Western Deeps is greater than what was reported in previous drilled holes. The best value reported to date is 16.0 g/t gold c ver 6.2 m (11.7 g/t over 6.2 m using a cut-off grade of 60 g/t gold).

Ten geotechnical holes were completed to the north of the Tiriganiaq deposit. These holes are designed to test the overburden characteristics at three potential portal locations, one of which will

provide future underground ramp or shaft access. Condemnation drilling was also completed in areas of possible infrastructure placement.

Surface sampling and prospecting continued along the 70-km Mel West property. Approximately 155 line-km of magnetic surveys has been completed on two zones on the far eastern portion of the property (CWM claims). A surface gold occurrence was discovered: the Akpik (Cloudberry) zone. It has been covered by 39 line-km of magnetic surveys on 12.5-m and 25.0-m line spacings. The Aklak target, 5 km southeast of the Akpik zone, was also covered by ground magnetic surveys (116 line-km) and detailed surface sampling. Plans are to mobilize a drill to this area for a spring 2006 drilling program.

NANUQ PROJECT

In 2003, Dunsmuir Ventures (now combined in a new entity under the corporate name of Peregrine Diamonds Ltd.) flew a 12 000-line-km high-resolution airborne magnetometer survey using a 150-m line-spacing and collected 472 till samples to complement previously acquired till sample results. KIMs recovered from the property include G9 and G10 pyrope garnets, diamond inclusion field eclogitic garnets, diamond inclusion field and kimberlitic chromites, chrome diopside, and olivine.

Following up on its 2004 FALCON ™ airborne gravity gradiometer and magnetic survey and on till sampling, the company collected an additional 199 till samples and carried out prospecting and staking of select areas within the original permit grouping in 2005. As of January 2006, the project area covers about 146 600 ha. BHP Billiton Diamonds Inc. maintains a back-in option on the property.

Kitikmeot Region

The Kitikmeot region spans the western and northern mainland of Nunavut and parts of Victoria, Prince of Wales, King William, and Somerset islands. Kugluktuk and Cambridge Bay are the largest communities in the region and provide services to exploration projects in the area; Yellowknife, to the south in the Northwest Territories, is also an important logistical centre.

The Kitikmeot region is geologically diverse. The westernmost portion is underlain by rocks of the Archean Bear Province. The Archean Slave Province occupies part of the western mainland and is overlain to the west and east by the Paleoproterozoic siliciclastic and carbonate rocks of the Wopmay Orogen; this Orogen separates the rocks of the younger Bear Province from the Slave. Inliers of paleoproterozoic rocks are found on Victoria Island, overlain by the Paleozoic Arctic Platform sedimentary rocks that cover most of the islands. In the east Kitikmeot region, the Slave Province is separated from the Western Churchill Province (Archean to Paleoproterozoic) by the paleoproterozoic Thelon orogen (around 1.9 billion years old); the Churchill province underlies most of the northern and northeastern mainland.

Tahera Diamond Corporation's Jericho diamond project is well on its way to becoming Nunavut's first diamond mine. Construction is proceeding on schedule with 505 loads of mine-site construction materials trucked in on the winter road and commercial production is anticipated to begin in 2006.

Development plans for production at the Doris North gold deposit (owner Miramar Mining Corporation) in the Hope Bay belt are continuing to progress through the regulatory processes. The company submitted its final Environmental Impact Statement to the Nunavut Impact Review Board (NIRB) in October 2005 and final technical hearings are scheduled in early 2006.

Diamonds and gold were the two primary commodities sought by companies in the Kitikmeot region. Recent diamond exploration covered virtually the entire western mainland and parts of Victoria and Somerset islands. The Coronation Gulf area of the Kitikmeot region continued to see

strong exploration activity, and the Boothia Peninsula and areas south of Kugaarak in the eastern Kitikmeot region were also active with a new diamond district, the Franklin, being identified in 2005. Traditional exploration targets in the region have also included massive sulphide-hosted base metals and uranium exploration.

ANIALIK PROJECT

Proximity and a similar geological setting to Wolfden Resources Inc.'s High Lake VMS deposit encouraged Strongbow Exploration Inc. to explore on the 62 519-ha Anialik property. This property is located within the Anialik River volcanic belt (ARVB) in the northern Archean Slave Province and this volcanic belt, like many in Nunavut, is an under-explored greenstone belt.

Exploration in 2005 was completed over a nine-week period and consisted of bedrock and soil geochemical surveys, mapping, prospecting and channel sampling. The main goal of the program was to investigate the mineral potential of the belt with particular focus on the gold potential of the associated volcanic rocks. A number of new gold discoveries were found through detailed mapping and approximately 3000 soil and 1000 rock samples were collected. The new discoveries are the Locanna, Frank, Greenstone, and Felicia showings, with the Locanna defining a linear zone extending over a strike length of about 3 km. Many of the prospecting samples on the four new discoveries returned values in excess of 1 g/t gold, with high values from the Locanna being 44.2 g/t gold, 20.9 g/t gold and 14.2 g/t gold. Channel sampling, also from the Locanna, returned the highest values of the Anialik property and, in three areas along a 7-m strike length of one vein, near the southern end of the corridor, returned 14.4 g/t gold over 1.6 m, 51.2 g/t gold over 0.25 m, and 6.8 g/t gold over 1.18 m.

BARROW AND DARBY PROJECTS

The highlight of Indicator Minerals Inc.'s 2005 exploration program (in a joint venture with Hunter Exploration Group) was the discovery of multiple kimberlite boulder trains on its two key properties, Barrow and Darby, located in the newly identified Franklin diamond district. Both projects are Indicator's most advanced and are scheduled for 2006 drilling.

Work on the Barrow project, approximately 110 000 acres of mineral claims located 15 km south of Kugaaruk, included the collection of 233 heavy mineral samples, prospecting and ground geophysics. Indicator minerals with diamond inclusion chemistry have been recovered in till samples and the interpretation of airborne geophysical data has identified high-priority targets up-ice from these mineral anomalies. Kimberlite float containing a macrodiamond was discovered while following up a geophysical target and a 6.7-kg sample has been sent for mineral analysis.

In 2005, work on the Darby project, located 120 km southwest of Kugaaruk and consisting of 77 mineral claims covering more than 197 000 acres, identified several kimberlite float occurrences that are concentrated in three distinct trains. One of these occurrences yielded a 3-kg peridotitic mantle nodule. Detailed airborne magnetic/EM geophysical surveys totaling 2400 line-km were flown over an area interpreted as the source of kimberlite indicator minerals recovered in 2004. Initial interpretation of this airborne data has outlined more than 15 high-priority targets. The largest target is interpreted as having a surface area of more than 10 ha, has coincident magnetic/EM signatures, and is associated with one of the kimberlite float trains discovered earlier this year.

BLUE ICE PROJECT

The Blue Ice project is owned by Diamonds North Resources Limited and is subject to a participation agreement with Teck Cominco Limited. This Victoria Island project is Diamonds North's most advanced. The Blue Ice property covers over 200 000 acres and straddles the Nunavut/Northwest Territories border. The geology consists of Ordovician carbonate platform rocks overlying the Proterozoic Shaler Group shale and Elice Formation sandstone; diabase dikes cut only the

Proterozoic rocks. Teck Cominco Limited is the operator on the property and funded more than $4.5 million of exploration in 2005.

Kimberlites and trends that have been identified on Victoria Island are Galaxy, Jaeger, King Eider, Pintail, Sanderling, Sand Piper, Snow Bunting and Turnstone. Exploration efforts since 2002 have focussed on the 20-km-long Galaxy and 25-km-long King Eider confirmed kimberlite trends, two semi-parallel, northwest-southeast-trending structures 30 km apart. The majority of the work in 2005 involved the King Eider kimberlite and drilling indicates that the body is at least 180 m long, is up to 50 m in width, and remains open to depth.

A mini-bulk sample of 2.8 t of King Eider kimberlite obtained from five drillholes (2.1 t of split core) and an additional 1.3 t of kimberlite collected from a trench have all been submitted for diamond analysis via caustic fusion. The collection of this sample followed encouraging results from the previously analyzed 680-kg composite sample taken in 2004 that yielded a 0.74-ct stone in a parcel of 434 diamonds weighing a total of 1.32 ct.

Three new kimberlite occurrences were discovered in 2005, increasing the number of known occurrences on Victoria Island from 36 to 39. One of these new occurrences is centrally located along the Galaxy trend and intersected 2.1 m and 17.15 m (true widths) of kimberlite and 5.3 m (true width) of brecciated kimberlite. The second discovery located on the southeastern portion of the King Eider structure consists of multiple hypabyssal kimberlite dikes with true widths of of less than 1 m each.

Seventy-five reverse circulation drillholes also tested 31 discrete geophysical targets, many of which were located "off-trend" of the Galaxy and King Eider structures. One additional kimberlite was intersected approximately 500 m northwest of the King Eider body. Additional 2005 work included 11 700 line-km of new airborne magnetic surveying and the collection of 200 till samples.

COPPERMINE RIVER PROJECT

Coronation Minerals Inc.'s property covers almost 76 000 acres and is believed to be highly prospective for world-class copper-nickel-platinum group metals (PGMs) orebodies. The Muskox layered ultramafic intrusion has recently become the focus of considerable exploration activity for its PGMs mining potential. Regional gravity studies suggest that most of the intrusion lies under cover rocks (i.e., the Coppermine River basalts) and is therefore under-explored. The most prospective target on the property is a gravity anomaly target that is arcuate-shaped and measures 2 km by 10 km. This gravity anomaly, coincident with an airborne magnetic anomaly, may represent a large intrusive body containing economic concentrations of nickel, copper and PGMs. There are at least 12 documented copper-silver occurrences as well as encouraging indications for gold and platinum.

GEORGE LAKE/GOOSE LAKE

The Back River joint venture (Dundee Precious Metals Inc. and Kinross Gold Corporation) quartz-vein hosted gold deposits are found within Archean banded iron formation within greywacke. In February 2005, Dundee Precious Metals bought an option to earn a 60% interest in the Back River project with a commitment to complete an exploration program on the properties totaling $25 million before August 2006. To date, over $10 million has been spent. The project is comprised of 45 mineral leases on Subsurface IOL, subject to grandfathered mineral claims and leases. The most important properties of the project comprise the George Lake and Goose Lake deposits with an indicated mineral resource of 1.4 million oz of gold and an inferred resource of 600 000 oz of gold. Mineralization is found at George Lake, Goose Lake, Boulder Pond and Boot Lake, and occurs in both the high-grade hinge fold zone and the greywacke zone within the core of the fold.

Gold exploration in the George Lake area began in 1982 and drilling began in 1985. In 1999, Kinross acquired the option from Kit Resources and Wheaton River Minerals Ltd. In early 2004,

Kinross and Miramar Mining Corporation finalized a joint-venture agreement on these two projects and Miramar designed an exploration program to add to the production capacity of Hope Bay.

However, in 2005, the ground was optioned to Dundee Precious Metals and 2005 was a busy year for the company. Exploration activity consisted of both a winter and summer diamond drill program totaling 16 000 m, airborne magnetic-EM geophysical surveys on the George, Goose and Boot lake deposits totaling 6500 line-km, reconnaissance prospecting to explore property-wide for new discoveries, and mapping verification of previous work.

HACKETT RIVER

Sabina Silver Corporation's Hackett River silver-zinc property hosts three significant massive sulphide deposits: the East Cleaver, Boot Lake and Main zones. Significant mineralized showings include the Knob Hill Zone, Downie, Finger Lake, and Jo Zone. Hackett River is one of the largest undeveloped massive sulphide deposits in Canada.

All deposits and showings are located at approximately the same stratigraphic interval and occur over a 6-km strike length. Mineralization in each of the three massive sulphide deposits consists primarily of coarse-grained pyrite, pyrrhotite, sphalerite, chalcopyrite, galena and rare tetrahedrite and trace arsenopyrite. Locally, mineral zoning is well developed both laterally and vertically. Total drilling in six showings (Boot Lake, A Zone West, A Zone East, Finger Lake West, Cigar Lake, and East Cleaver) totaled 9300 m in 2005.

An updated mineral resource estimate by Wardrop Engineering Inc. for Sabina, at a zinc-equivalent cut-off grade of 3%, demonstrates that the Boot Lake, East Cleaver and Main Zone contain a combined resource of 51.6 Mt. This includes an indicated mineral resource of 37 Mt with an average grade of 4.66% zinc, 3.79 oz per ton silver, 0.63% lead, 0.34% copper and 0.011 oz per ton gold. The resource estimate, based on drilling done in 2004 and earlier, indicates an indicated metal content of more than 150 million oz of silver and 1.7 Mt of contained zinc.

HIGH LAKE

Significant advancements were made at the High Lake copper-zinc-silver-gold property (Wolfden Resources Inc.) through both exploration and development. The property consists of 15 leases (1710 ha) located mainly on subsurface IOL. The indicated resource, using a 2.5% cut-off equivalent, averages 5.01% copper equivalent and these values place the High Lake deposit amongst the highest-grade undeveloped copper deposits in the world. In 2005, a renewed focus on exploration resulted in three newly identified mineralized areas (Sand Lake, WW zone and Cairo zone), in addition to the known A/B, D and West zones.

Significant mineralization continued to be intersected at depth in the West zone. Deep drilling in this area extended the deposit by 150 m at depth. One hole intersected three zones of high-grade mineralization and assayed 4.72% copper, 1.96 g/t gold and 22.66 g/t silver across 8.0 m, 1.52% copper across 10.45 m, and 4.40% copper, 2.18% zinc, 0.82 g/t gold and 66.72 g/t silver across 27.0 m. A broad zone of stringer and massive sulphides associated with an extensive zone of alteration was also intersected, suggesting that this hole intersected the "feeder" for the West zone deposit and that there is potential for significant expansion at depth. Prior to this drilling, the West zone was calculated to host a high-grade polymetallic mineralization resource exceeding 10 Mt.

Three new discoveries were identified by following up on areas of mapped intense alteration and/or airborne conductors identified in the 2002 airborne geophysical survey; all three new zones will be drill tested in 2006.

In November 2003, Wolfden released its Strategic Plan for the High Lake mine project. The Environmental Impact Statement (EIS) to satisfy requirements of the Nunavut Impact Review Board

(NIRB) is expected at the beginning of the second quarter of 2006. The preliminary underground mine plan on the West zone is completed and open-pit models for the A/B and D zones are being refined prior to implementation into the pre-feasibility study, which will be completed in early 2006. The future mine plans involve the infrastructure from the Nanisivik mill facility that will be shipped in 2006. The location of the proposed port site to service the High Lake project is Grays Bay in the Coronation Gulf.

HOPE BAY PROJECT - DORIS NORTH, MADRID, BOSTON

The Hope Bay project was again the largest exploration project in Nunavut with a $15.5 million 2005 exploration program. This project, 100% owned by Miramar Mining Corporation, is within the Hope Bay greenstone belt that, at 80 km long in a north-south direction and 7-20 km wide, is one of the most prospective undeveloped belts in Canada. Large portions of the ground are Inuit-owned and administered by NTI. Located in the northeast corner of the Slave Province, the Hope Bay belt is a typical Archean greenstone belt, comparable to the Yellowknife, Kirkland Lake and other prolific gold belts. Significant gold deposits defined on the project include Doris, Madrid (with Naartok and Suluk) and Boston. Current resource estimates are 5.4 million oz of gold with measured and indicated resources of 1.8 million oz at 9.9 g/t gold and an inferred resource of 3.6 million oz of 6.9 g/t gold.

Work in 2005 consisted of six different initiatives, including permitting of the Doris North project, definition and expansion drilling on the Naartok and Doris Central deposits, regional exploration including diamond drilling in the Madrid Corridor, regional exploration and mapping work to satisfy assessment requirements, and ongoing resource modelling of the Boston deposit.

The Doris deposit is situated at an inferred inflexion in the Hope Bay structural break and consists of a steeply dipping, over 3-km-long quartz vein system in folded and metamorphosed pillow basalts. At the north end, the veins are folded to create a high-grade anticlinal hinge zone lying close to surface (Doris North). Gold is found at quartz vein and wall-rock contacts and is associated with dark-coloured tourmaline-pyrite septa or ribbons.

In May 2005, a Part 5 review of the Doris North project under the Nunavut Land Claims Agreement was approved by the Minister of INAC. The Nunavut Impact Review Board (NIRB) held technical meetings in mid-August to review the Environmental Impact Statement (EIS) and Miramar submitted its Final EIS on October 31, 2005. The NIRB has scheduled final public hearings in late January/early February 2006 in Cambridge Bay and, with a positive review, Miramar would then enter the regulatory phase of the permitting process and file applications for various licences and permits.

Drilling at Doris Central encountered significant mineralization, including 54 g/t gold over 4.4 m. Most of the Doris Central deposit has now been drilled off at 25-m centres and resource limits are reasonably well established.

At the Madrid deposit, 2003 resource estimates define indicated resources of 565 000 oz of gold grading 4.9 g/t and inferred resources of 1 886 000 oz of gold of similar grade. Most resources, including the significant gold showings Naartok and Suluk, lie within the northern 2 km of the 11-km Deformation zone.

Naartok area in-fill in 2005 consisted of 6020 m of drilling in 17 holes and returned some spectacular results such as drillhole 05PMD328 (11.5 g/t gold over 66.5 m at a depth of 275 m below surface). The Naartok area is currently drilled off on 25-m spacings to a depth of 200 m and at 50-m spacings to a depth of 300 m.

The Boston deposit, located near the south end of the belt, is associated with a flexure in the Hope Bay structural break. Gold and sulphides (mostly pyrite) are found in clots within quartz veins and

within the wall-rock halo. Measured and indicated resources are 687 000 oz at 15.4 g/t gold and inferred resources are 900 000 oz at 10.9 g/t gold. Field work at Boston in 2005 was limited to relogging drillholes and resource modelling using 2004 drilling results.

JERICHO DIAMOND PROJECT

Tahera Diamond Corporation entered the environmental review process in 2000 for the development and operation of the Jericho diamond mine. The company received federal approval in 2004 for the project to proceed and signed a formal Inuit Impact Benefit Agreement (IIBA) with the Kitikmeot Inuit Association (KIA). Tahera also entered into an agreement with Tiffany and Co. for the purchase and marketing of the diamonds, with Tiffany providing $35 million to assist with project financing.

Highlights of 2005 are that the Jericho diamond mine construction schedule is on track for substantial completion by year-end. Commercial production is planned for the end of the first quarter of 2006. The project is planned for a duration of nine years (2005 to 2014) and current proven reserves are defined as 2.6 Mt averaging 1.2 ct/t diamonds. The mine will be an open-pit mine for years 1 to 4, processing 330 000 tonnes per year (t/y) on site, followed by underground mining.

CORONATION GULF

The Coronation Gulf diamond district, southeast of Kugluktuk, covers the northern portion of the Archean Slave Province and 21 kimberlites, including 11 that contain diamonds, have been discovered in the area. The first kimberlite, the Potentilla, was discovered in 2001 and started a 4-million-acre staking rush, that encompassed the majority of this diamond district. Numerous companies are working in this area either on wholly owned properties or as joint-venture projects. These companies include Ashton Mining of Canada, Stornoway Diamonds, Strongbow Exploration, Diamondex, and Shear Minerals.

3. Canadian Exploration Activity Around the World

3.1 INTRODUCTION

This section provides an overview of Canadian mineral exploration activity[27] abroad. It also highlights the domestic and foreign components of the larger-company exploration market in Canada. The information in this review[28] was current as at September 2005.

3.2 GLOBAL MARKET FOR MINERAL EXPLORATION

The year 2004, much like the previous one, was very favourable for the financing of mining companies. Over $11.4 billion in equity capital was raised on international markets for mineral exploration and development projects around the globe.[29] Almost half of the funds raised during the year were for companies listed on Canadian stock exchanges.

The value of exploration programs expected to be undertaken worldwide in 2004 for precious metals, base metals and diamonds (**Table 26**) rose to over $5.0 billion (US$3.8 billion), up in constant Canadian dollars by $1.5 billion, or 40%, from the $3.6 billion that companies planned to spend in 2003.[30] The value of these programs includes the budgets of the larger companies and those of the smaller companies. It also includes estimates for firms that do not disclose their exploration plans and for firms that were likely to spend less than $133 000 (US$100 000) in 2004.

The world's larger companies are defined, in this paper, as those companies that planned to spend at least $4.0 million (current US$3 million) on mineral exploration in 2004; the world's smaller companies are defined as those companies that planned to spend at least $133 000, but less than $4.0 million, on mineral exploration in 2004.

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[27] Most of the statistical data on the larger-company mineral exploration market are based on *Corporate Exploration Strategies: A Worldwide Analysis*, published annually by Metals Economics Group, Halifax, Nova Scotia. MEG counts, as exploration, work from the earliest stage through perimeter drilling, reconnaissance and evaluative forays, as well as work to further quantify and define an identified orebody once the target outline stage has been completed. It also counts as exploration all feasibility work up to the point of a production decision. The information on specific projects is based on company reports.

[28] Chapter 3 of this report is a summary of an article from the 2004 *Canadian Minerals Yearbook* published by Natural Resources Canada (available on the Internet at www.nrcan.gc.ca/mms/cmy).

[29] Mining and Exploration Company Financings: *Monthly Records and Historic Trends, December 2004*, Gamah International Limited, Toronto, Ontario, January 2005, Section II, pp. 1-100.

[30] Unless indicated otherwise, all currencies in this review are expressed in Canadian dollars and currency comparisons between years are expressed in constant Canadian dollars.

TABLE 26. WORLDWIDE EXPLORATION BUDGETS FOR PRECIOUS METALS, BASE METALS OR DIAMONDS, BY TYPE OF COMPANY AND BY DOMICILE OF COMPANY, 2004

	Canada	Australia	Africa-Middle East	Europe-FSU	United States	Latin America	Other Asia-Pacific	Unspecified Domicile	Total	Proportion of Subtotal
					($ millions)					(%)
Larger companies	1 414	486	573	492	405	276	55	–	3 701	78
Smaller companies	608	295	11	52	33	30	8	–	1 037	22
Subtotal	2 022	781	584	544	438	306	63	–	4 738	100
Other	..	..	..	..	..	..	..	296	296	
Total	..	..	..	..	..	..	..	296	5 034	

Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.
– Nil; . . Not available.
Notes: "Larger companies" are defined here as those with budgets for mineral exploration in 2004 of $4.0 million (US$3 million) or more. There were 213 such companies in 2004. These companies usually account for roughly 80% of documented annual global exploration budgets. There are 13 years of data available for these companies. The focus of this paper is on the larger companies. "Smaller companies" are defined here as those with budgets for mineral exploration in 2004 of at least $133 000 (US$100 000), but less than $4.0 million (US$3 million). There were 925 such companies in 2004. General comments about these companies as a group appear in this paper. "Other" includes estimates for companies with budgets for mineral exploration in 2004 of less than $133 000 (US$100 000) and estimates for companies that undertake significant exploration programs, but that did not disclose their budgets for 2004. There were roughly 250 such companies in 2004. These companies are ignored in this paper.

The number of companies that reported budgets for mineral exploration of at least $133 000 rose to 1138, up by 221 firms, or 24%, from 917 the previous year. As a group, these 1138 companies planned to spend $4.7 billion in 99 countries. Almost 680, or 60%, of these companies were based in Canada.

Compared with the previous year, the budgets of companies that planned to spend at least $133 000 on mineral exploration in 2004 increased for almost 80% of the countries in which they expected to operate. Their year-over-year budgets grew by $225 million for Canada, by $190 million for Australia, by $150 million for the United States, by $120 million for Russia, by roughly $90 million for each of China, Mexico, Mongolia and Peru, and by $70 million for South Africa. In each of the few countries where decreases in exploration budgets were expected to occur from 2003 to 2004, these decreases were likely to amount to less than $5 million, except in New Caledonia where the decrease was likely to be about $20 million.

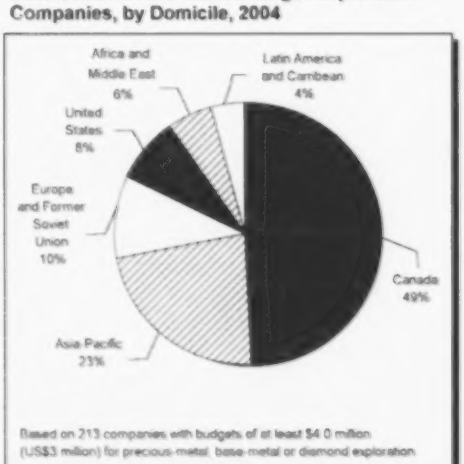
3.3 WORLD'S LARGER COMPANIES

Global trends in mineral exploration are based on data for the world's larger companies. The larger companies are the only ones for which there are consistent multi-year data on worldwide exploration plans. There are currently 13 years of such data available. Therefore, the focus of this paper is on this group of companies.

During 2004, the world's larger companies were expected to undertake exploration programs with a combined value of $3.7 billion (US$2.8 billion) in 74 countries, six more than in 2003. The aggregate budgets of the world's larger companies increased by $1.2 billion, or 48%, from $2.5 billion the previous year.

In 2004, the number of companies based around the world that intended to spend at least $4.0 million on mineral exploration rose to 213 (**Figure 46**), compared with only 100 that planned to spend an equivalent amount in 2003. In 1997, the number stood at 279, a record high.

Figure 46
Distribution of the World's Larger Exploration Companies, by Domicile, 2004


Africa and Middle East 6%
Latin America and Caribbean 4%
United States 8%
Europe and Former Soviet Union 10%
Canada 49%
Asia Pacific 23%
Based on 213 companies with budgets of at least $4.0 million (US$3 million) for precious-metal, base-metal or diamond exploration

Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.

Although, in 2004, the world's 213 larger companies represented only about 19% of the 1138 companies that reported exploration budgets of at least $133 000, they accounted for 78% of the value of their programs (**Table 26**). On a commodity basis, the larger companies accounted for 87% of the value of worldwide programs aimed at diamonds, for 83% of those aimed at base metals, for 80% of those aimed at platinum group metals (PGMs), and for 74% of those aimed at gold.

On a regional basis, the world's larger companies accounted for 85% of the value of the exploration programs planned for Africa and the Middle East; for 84% of those planned for Latin America, the Caribbean, Europe and the former Soviet Union (FSU); for 83% of those planned for the United States; for 73% of those planned for Asia-Pacific; and for 67% of those planned for Canada.

3.4 WORLD'S SMALLER COMPANIES

During 2004, the world's smaller companies were expected to undertake exploration programs around the world with a combined value of $1.0 billion (US$778 million). About 30% of the budgets of these companies were expected to be spent in Canada.

The smaller companies are significant contributors to mineral exploration and development in many regions of the world. In many countries, the smaller companies are the only ones that undertake commercial mineral exploration. In 2004, there were 25 countries where the only firms planning to be active in mineral exploration was smaller companies.

In 2004, 925 companies were classified as smaller companies, up from 817 in 2003. Almost two-thirds of these companies were based in Canada.

The smaller companies are a significant component of the exploration activity occurring in Australia and Canada. In 2004, the smaller Canadian-based companies accounted for 30% of the budgets of the smaller and larger Canadian-based companies combined; in Australia the comparable figure was 38%.

The smaller Canadian companies planned to spend $303 million in Canada, or 50% of their worldwide budgets of $608 million; in Australia, the comparable figures were $223 million, or 76% of worldwide budgets of $295 million.

Although the world's smaller companies accounted for 22% (**Table 26**) of the value of all exploration programs expected to be undertaken worldwide during 2004, their activities are not addressed specifically here.

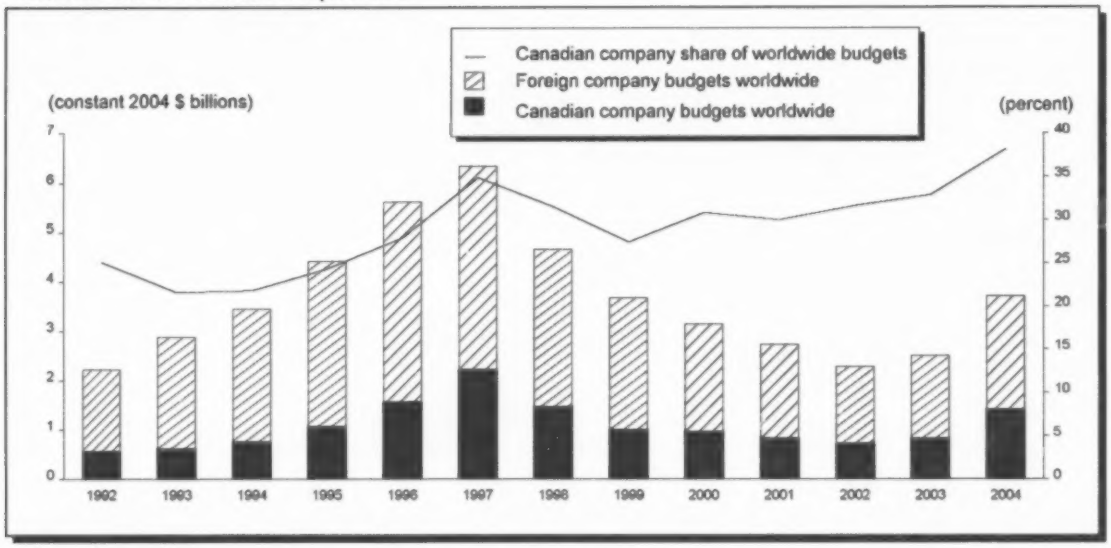
3.5 LARGER CANADIAN-BASED COMPANIES

There are more mining companies based in Canada than anywhere else. In 2004, 105 of the world's 213 larger companies were based in this country (**Figure 46**), up from 45 in 2003.

In 2004, the value of the exploration programs that the 105 larger Canadian-based companies planned to undertake in Canada and elsewhere around the world increased to more than $1.4 billion (**Figure 47**), up by $590 million, or 70%, from the $824 million that they budgeted in 2003.

The larger Canadian-based companies allocated 59% of their budgets to explore for gold, 30% to explore for base metals, 6% to explore for diamonds, and 1% to explore for PGMs. The proportion of the total budgets of the larger Canadian-based companies allocated to gold was considerably larger than the industry average, while the proportions that they allocated to diamonds and to PGMs were substantially smaller. In comparison, the world averages for gold, base metals, diamonds and PGMs stood at 47%, 28%, 15% and 5%, respectively.

Figure 47
Exploration Budgets of the World's Larger Companies, by Domicile, 1992-2004
Companies With Worldwide Budgets of at Least $4.0 Million in 2004 for Precious-Metal, Base-Metal or Diamond Exploration



Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.
Notes: The worldwide exploration budgets of companies that intended to spend less than $4.0 million (US$3 million) in 2004 and an equivalent amount in previous years are excluded. The worldwide exploration budgets for other commodities such as uranium or industrial minerals are also excluded.

The value of the programs that the larger Canadian-based companies planned to undertake during 2004 grew to 38% of the value of all larger-company exploration programs for the entire world compared with one-third in 2003. However, adding the value of the programs of the smaller Canadian-based companies to those of the larger ones raises the proportion of the value of exploration programs planned by Canadian-based companies here and abroad to almost 43% of all of the expected world activity.

Canadian companies account for the dominant share, by far, of the value of all mineral exploration programs planned worldwide by the larger companies. In contrast, in 2004, the larger companies based in Africa accounted for 15%, those based in Europe and those based in Australia each accounted for 13%, and those based in the United States accounted for 11%.

The larger Canadian-based companies typically budget less individually for exploration programs than the industry average worldwide. In 2004, the aggregate exploration budgets of the larger Canadian-based companies had a mean of $13.5 million and a median of $6.7 million. This compared with global averages of $17.4 million and $6.9 million, respectively. The largest Canadian mineral exploration budget in 2004 was $147 million, while the world's largest was $227 million.

Although, on a company-by-company basis, there can be significant variations between exploration budgets and expenditures, aggregate budgets generally provide a reliable estimate of the total amount that is likely to be spent in the field. In 2003, 45 larger Canadian-based companies, as a

group, exceeded their exploration budgets by $104 million, or by about 14% more than they had initially planned to spend. In comparison, the larger Canadian-based companies under-spent their budgets by roughly 7% in each of 1998 and 1999.[31]

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in a portfolio of more than 7100 mineral properties (**Figure 48**) located in Canada or in more than 100 other countries around the world.[32] Most of this portfolio consists of properties at the early stages of exploration.

The number of properties in which these companies held interests worldwide at the end of 2004 increased by more than 700, or 11%, compared with the number that they held at the end of the previous year. More than 40% of the increase in the portfolio of interests in mineral properties occurred in Canada. This reflects, in part, the growing recognition by the global mining industry of the diamond and PGMs potential in this country.

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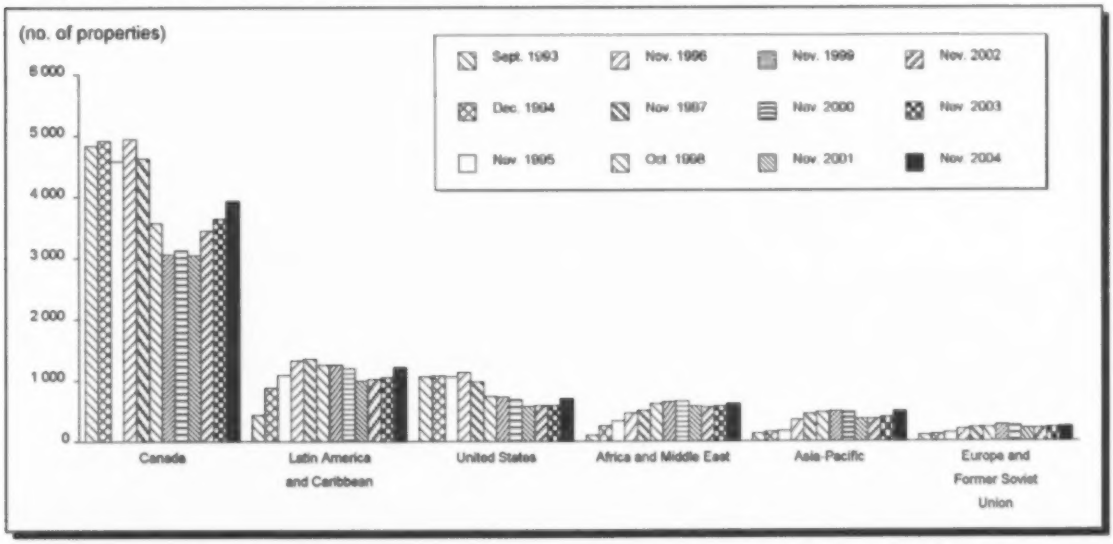
[31] André Lemieux, "Canada's Global Mining Presence," in the 1998 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa, pp. 7.1 and 7.2 (www.nrcan.gc.ca/mms/cmy/content/1998/08.pdf). See also André Lemieux, "Canada's Global Mining Presence," in the 1999 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa, pp. 7.1 and 7.3 (www.nrcan.gc.ca/mms/cmy/content/08.pdf).

[32] Most of the data for 1991 through 1997 on the mineral property portfolio of companies of all sizes listed on Canadian stock exchanges are derived from MIN-MET CANADA; for 1998 through 2004, the data are derived from InfoMine db. These databases are products of Robertson Info-Data Inc. of Vancouver, British Columbia.

Figure 48
Canadian Mineral Property Portfolio Worldwide, by Region, 1993-2004
Companies of All Sizes Listed on Canadian Stock Exchanges



Source: Natural Resources Canada, based on *MIN-MET CANADA* for 1993-97 and InfoMine db for 1998-2004, Robertson Info-Data Inc., Vancouver, British Columbia, and used under licence.
Note: The decrease in properties in Canada after 1997 is due, in part, to the implementation of database features that make it possible to exclude many inactive properties.

3.6 LARGER-COMPANY EXPLORATION MARKET IN CANADA

In 2004, the larger-company mineral exploration market in Canada was valued at $622 million (**Figure 49**), up by almost $169 million, or 37%, from roughly $453 million in 2003. As in the previous two years, Canada, in 2004, remained the country where the global mineral exploration industry expected to be the most active. Australia held that position from 1992 through 2001.

In 2004, 69 of the world's larger domestic-based or foreign-based companies planned to explore for minerals in Canada, up from 41 companies in 2003. During 2004, almost 17% of the exploration efforts of the world's larger companies was expected to take place in Canada, roughly the same proportion as in 2003 (**Figure 50**). However, including the exploration programs of the smaller companies with those of the larger ones raises the proportion of the world's total exploration activity planned for Canada in 2004 to roughly 20%.

At the end of 2004, there were more than 3900 mineral properties with recent exploration activity in this country[33] (**Figure 48**), about 300 more properties than at the end of 2003.

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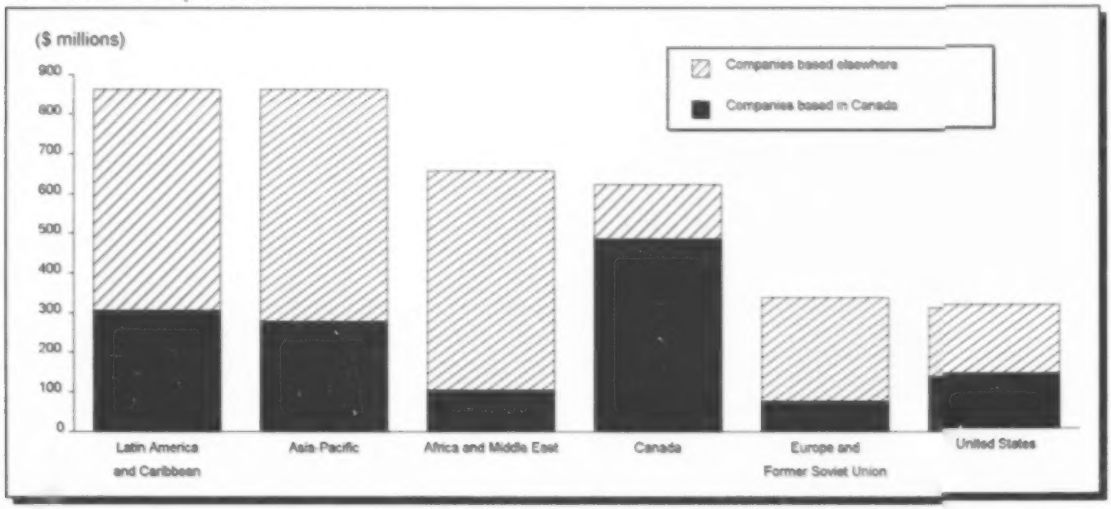
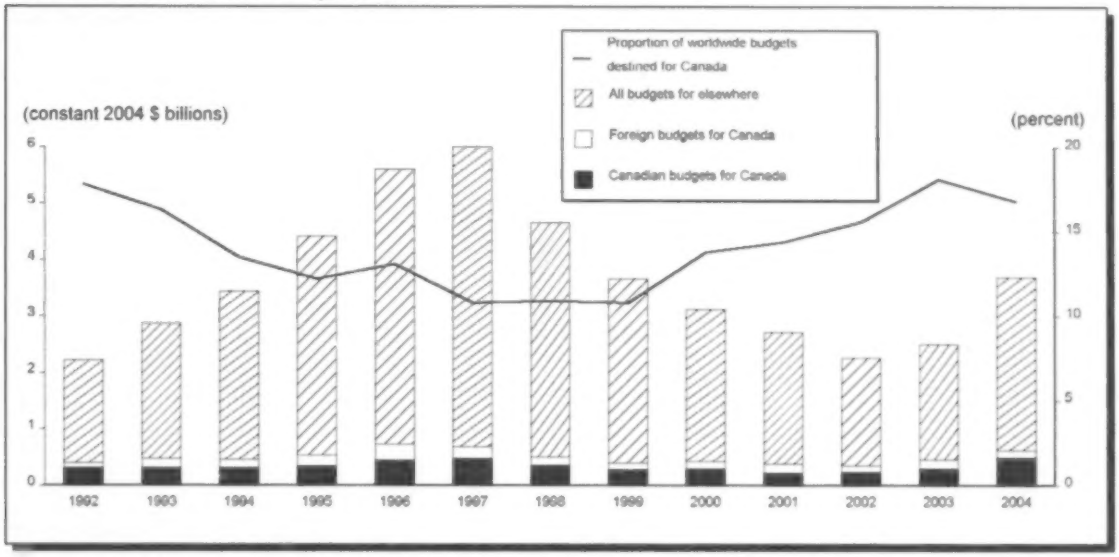
[33] For trends in mineral deposit appraisal activity in Canada over the interval 1982-97, and for a list of projects at the deposit appraisal stage in the late 1990s, see André Lemieux, "Canada's Global Mining Presence," in the 1996 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa, pp. 8.9 and 8.11-8.22 (www.nrcan.gc.ca/mms/cmy/content/1996/08.pdf).

Figure 49
Exploration Budgets of the World's Larger Companies for Selected Regions of the World, 2004
Companies With Worldwide Budgets of at Least $4.0 Million for Precious-Metal, Base-Metal or Diamond Exploration



Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.
Notes: The worldwide exploration budgets of companies that intended to spend less than $4.0 million (US$3 million) in 2004 are excluded. The worldwide exploration budgets for other commodities such as uranium or industrial minerals are also excluded.

Figure 50
Exploration Budgets of the World's Larger Companies for Canada and Elsewhere, 1992-2004
Companies With Worldwide Budgets of at Least $4.0 Million in 2004 for Precious-Metal, Base-Metal or Diamond Exploration



Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.
Notes: The worldwide exploration budgets of companies that intended to spend less than $4.0 million (US$3 million) in 2004 and an equivalent amount in previous years are excluded. The worldwide exploration budgets for other commodities such as uranium or industrial minerals are also excluded.

3.6.1 Larger Canadian-Based Companies in Canada

In 2004, 57 of the larger Canadian-based companies allocated, in total, almost $485 million for mineral exploration in Canada (**Figure 49**). Their budgets were up by more than $195 million, or 67%, from the $290 million that they allocated in 2003. For the fifth year in a row, Canadian companies planned to spend more on mineral exploration in Canada than they planned to spend in all of the Latin American countries combined.

With increasing globalization, the share of the domestic exploration market controlled by Canadian-based companies generally fell annually as foreign-based companies increased the amount of activity that they undertook in this country. However, in 2004, the share of the larger-company mineral exploration market controlled by the larger Canadian-based companies grew to 78%, up from 64% in 2003. In 1992, domestic companies controlled 80% of the Canadian market. Since the early 1990s, the annual decrease in the share of the domestic exploration market controlled by the larger local firms has generally been more pronounced in the United States and Australia than in Canada.

Because mineral exploration is such an international enterprise, the dominance of exploration programs by domestic firms is relatively uncommon. In 2004, there were only nine countries, other

than Canada, where domestic companies accounted for more than half of the value of the larger-company market for mineral exploration: Australia (50%), Brazil (54%), Russia (57%), Sweden (75%), South Africa (80%), Kazakhstan (89%), and Japan, Lesotho and Spain, each with 100%. Although, during 2004, the larger-company mineral exploration market was valued at $472 million in Australia, at $224 million in South Africa, at $193 million in Russia, and at $166 million in Brazil, it was valued at only $21 million in Sweden, at $12 million in Spain, at $6 million in each of Kazakhstan and Lesotho, and at less than $2 million in Japan.

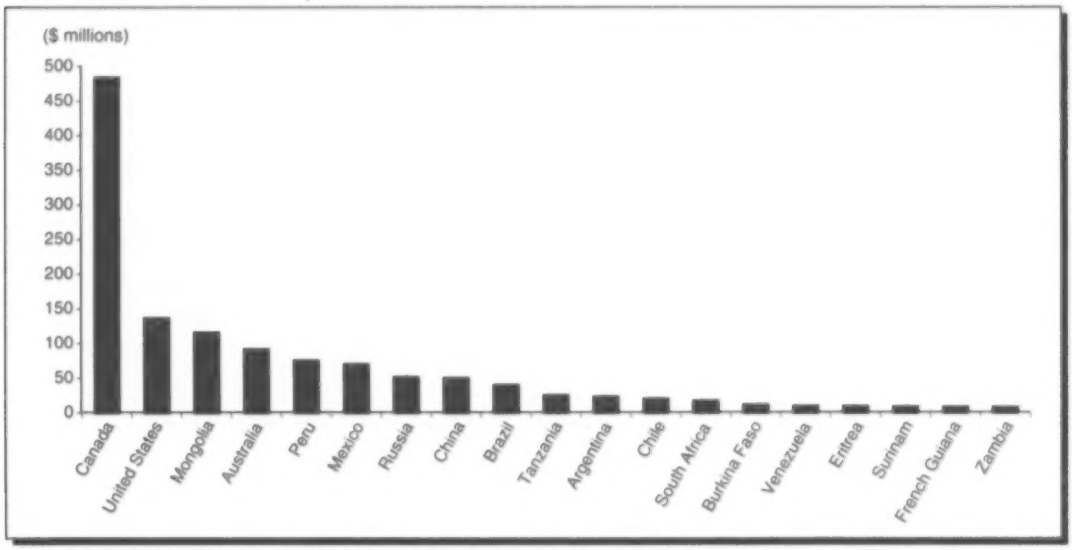
In 2004, the larger Canadian-based companies allocated 34% of their global exploration budgets to programs for Canada. In 1992, that proportion was 57%. In comparison, in 2004, the larger Australian-based companies allocated 48% of their global budgets to domestic exploration while American companies allocated 22%.

Although Canadian companies operate all over the world, Canada remains the country where they conduct the largest proportion, by far, of their global mineral exploration programs (**Figure 51**).

3.6.2 Foreign-Based Companies in Canada

During 2004, 12 of the larger foreign-based companies planned to spend, in total, almost $138 million on mineral exploration in Canada (**Figure 49**), down by $26 million, or 16%, from $164 million in 2003. In 2004, foreign-based companies were expected to undertake 22% of all larger-company exploration programs planned for this country.

Figure 51
Exploration Budgets of the Larger Canadian-Based Companies, 2004 - Countries Accounting for 90% of Canadian Budgets
Companies With Worldwide Budgets of at Least $4.0 Million for Precious-Metal, Base-Metal or Diamond Exploration



Source: Natural Resources Canada, based on *Corporate Exploration Strategies: A Worldwide Analysis*, Metals Economics Group, Halifax, Nova Scotia.
Notes: The worldwide exploration budgets of companies that intended to spend less than $4.0 million (US$3 million) in 2004 are excluded. The worldwide exploration budgets for other commodities such as uranium or industrial minerals are also excluded.

The larger foreign-based companies active in mineral exploration in Canada in 2004 included the BHP-Billiton group based in Australia; Phelps Dodge Corporation and Meridian Gold Inc., both based in the United States; the Anglo American group, Lonmin Plc, and Rio Tinto plc, all based in the United Kingdom; Boliden Limited, based in Sweden; Anglo American Platinum Corporation Limited, AngloGold Ashanti Limited, the De Beers group, and Gold Fields Limited, all based in South Africa; and Grupo México S.A. de C.V., based in Mexico.

In 2004, De Beers and BHP-Billiton were expected to spend roughly $52 million each on mineral exploration in Canada. The budgets of these companies represented the largest exploration programs planned for this country during the year. The entire budget of De Beers for Canada was directed at diamonds, as was almost all the budget of BHP-Billiton. Together these companies accounted for 17% of all the larger-company exploration budgets for Canada.

3.7 LARGER CANADIAN-BASED COMPANIES ABROAD

In 2004, the larger Canadian-based companies planned to spend almost $929 million on mineral exploration outside of Canada (**Figure 49**). Their foreign budgets were up by $395 million, or roughly 75%, from the more than $534 million that they planned to spend in 2003.

Almost two-thirds of the worldwide budgets of the larger Canadian-based companies were allocated to programs abroad in 2004, about the same proportion as in each of the previous two years. The foreign programs of the larger Canadian-based companies, as a proportion of their domestic and foreign programs combined, peaked at over 78% in 1997. In 1992 that proportion was only 43%.

More than 70% of the 105 larger Canadian-based companies planned to work abroad during 2004: 48 of these companies (46%) planned to work only abroad, 26 of them (25%) planned to work in both Canada and abroad, and 31 of them (29%) planned to work only in Canada.

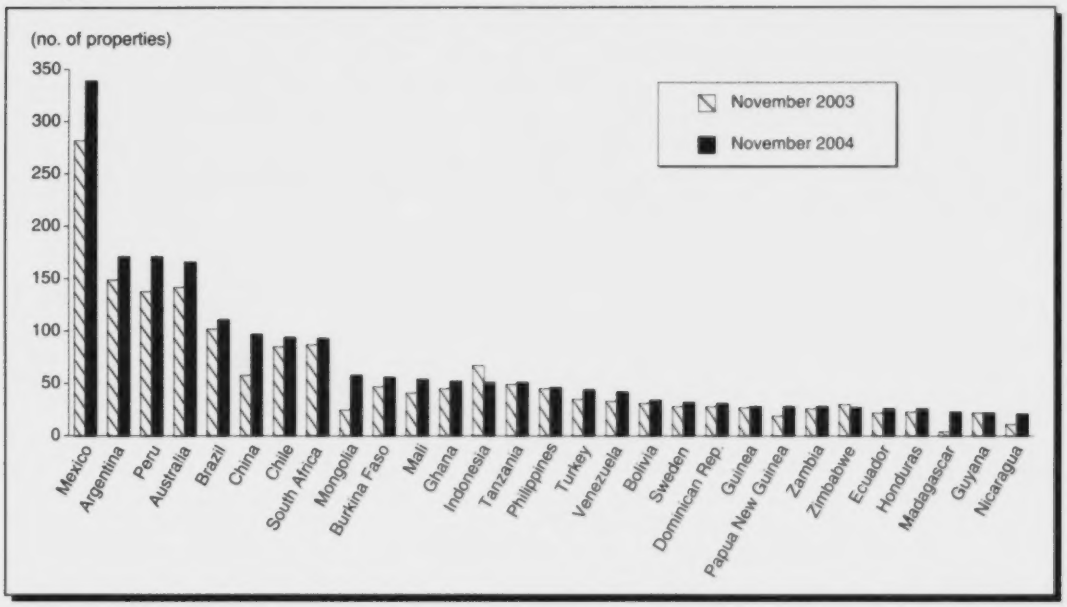
Although mining is a global enterprise, undertaking exploration programs in several countries simultaneously is relatively uncommon. In 2004, only 11 (10%) of the 105 larger Canadian-based companies budgeted for programs in five or more countries, 21 (20%) budgeted for programs in two countries, and 59 (56%) budgeted for programs in only one country.

Smaller companies are less likely to undertake foreign operations than the larger ones. In 2004, only half of the 573 smaller Canadian-based companies budgeted for work abroad: 212 of these companies (37%) planned to work only abroad, 77 of them (13%) planned to work in both Canada and abroad, and 284 of them (50%) planned to work only in Canada. Of these 573 smaller Canadian-based companies, only 1 planned to work in five or more countries, 98 of them (17%) planned to work in two countries, and 455 of them (79%) planned to work in a single country.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in a portfolio of almost 3200 mineral properties located abroad (**Figure 48**), up by over 400 properties compared with the number that they held at the end of the previous year.

Foreign properties represent almost 45% of the total mineral property portfolio held by companies of all sizes listed on Canadian stock exchanges. In 1992, that proportion was only one quarter. Apart from the United States, where companies of all sizes listed on Canadian stock exchanges have a substantial mining presence, about 30 other nations, spread across the globe, account for much of the balance of their foreign mineral property portfolio (**Figure 52**).

Figure 52
Canadian Mineral Property Portfolio Abroad, 2003 and 2004 - Countries Accounting for 80% of Canadian Holdings Located Outside the United States in 2004
Companies of All Sizes Listed on Canadian Stock Exchanges



Source: Natural Resources Canada, based on InfoMine db, Robertson Info-Data Inc., Vancouver, British Columbia, and used under licence.

In mid-2000, Canadian companies had interests in over 200 mines, smelters, refineries, plants under construction, or other advanced mineral development projects in roughly 60 foreign countries.[34] Canadian companies also had interests in hundreds of other projects at the early stages of exploration in these countries and in more than 40 others.

At the beginning of 2003, there was at least US$54 billion worth of new copper, diamond, gold, iron, nickel, PGMs, silver or zinc mining projects, each with a value of at least US$65 million, either at the planning, feasibility, construction or deferred stage of development in Canada or elsewhere around the world.[35] Although, at that time, only 9% of the total value of those projects was expected to be invested in this country, Canadian companies were expected to participate in roughly 30% of all mining investment planned for Canada and the other regions of the globe.

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[34] For a list of mines, smelters, refineries and other advanced mineral development projects in which companies based in Canada had an interest in mid-2001, see André Lemieux, "Canada's Global Mining Presence," in the 2000 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa, pp. 7.16-7.19 (www.nrcan.gc.ca/mms/cmy/content/08.pdf).

[35] "Project Investment Survey 2003," *Engineering & Mining Journal*, January 2003, pp. 28-34.

The activities of Canadian mining companies in Canada and abroad have fostered the development, in this country, of over 2200 suppliers of specialized mining goods and services. Many of these suppliers, such as some drilling companies, export their products all over the world.[36]

3.7.1 United States

In 2004, the larger-company mineral exploration market in the United States was valued at $311 million (**Figure 49**), or more than 8% of the $3.7 billion larger-company market worldwide. Larger-company budgets for the United States were up by $128 million, or by more than 70%, compared with those of the previous year. Twenty-one of the larger Canadian-based companies planned to spend, in total, over $137 million in the United States, up from $89 million in 2003.

The share of the larger-company mineral exploration market held by Canadian-based companies in the United States in 2004 stood at 44%, down somewhat from 49% the previous year. The United States ranks second, after Canada, in terms of countries where Canadian companies are the most active in mineral exploration (**Figure 51**).

During 2004, Canadian companies planned to spend 50% more on mineral exploration in the United States than domestic firms. The annual budgets of American companies for domestic exploration increased for the first time since 1997. The budgets of domestic companies for the United States had generally been falling annually from a high of over $290 million in 1992. Although U.S. companies accounted for almost 60% of the value of exploration programs in their country in 1992, their activities represented only 29% in 2004. Since 1998, U.S. companies have allocated less than one-quarter of their worldwide budgets to domestic exploration.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in 680 mineral properties in the United States (**Figure 48**), roughly 100 more than in which they held interests at the end of the previous year. In 2000, companies of all sizes listed on Canadian stock exchanges had interests in properties located in 22 states, but their efforts were concentrated mainly in the western part of the country in Nevada, Alaska, California, Arizona, Montana, Idaho, Wyoming, Colorado, Washington, Utah and South Dakota in decreasing order.[37] That year, Nevada alone accounted for more than 250 of their interests in mineral properties, or for almost 40% of the total Canadian portfolio in the United States.

Although Canadian companies have expanded considerably their activities in Latin America, Africa and Asia since the early 1990s, the United States is likely to remain, for the foreseeable future, the foreign country where they hold their largest portfolio of mineral properties. At the end of 2004, the United States accounted for over 20% of all interests in properties held abroad by companies of all sizes listed on Canadian stock exchanges.

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[36] For a discussion of the global market for mining goods and services, and the role played by Canadian companies, see André Lemieux, *Canadian Suppliers of Mining Goods and Services: Links Between Canadian Mining Companies and Selected Sectors of the Canadian Economy*, Natural Resources Canada, Ottawa, September 2000, 84 pp. (www.nrcan.gc.ca/mms/pubs/services-mines-e.pdf).

[37] For the geographic distribution, by state, of mineral properties in which Canadian companies have an interest in the United States, see André Lemieux, "Canada's Global Mining Presence," in the 2000 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa, pp. 7.5-7.7 (www.nrcan.gc.ca/mms/cmy/content/08.pdf).

3.7.2 Latin America and the Caribbean

In 2004, the larger-company mineral exploration market in Latin America and the Caribbean was valued at over $860 million (**Figure 49**), or 23% of the $3.7 billion larger-company market worldwide. The larger Canadian-based companies planned to spend $305 million in the region, up by $116 million, or more than 60%, from $189 million in 2003.

After Canada, Latin America and the Caribbean is the region of the world where Canadian companies are currently the most active in mineral exploration (**Figure 49**). However, from 1995 to 1999, Canadian companies spent more on mineral exploration in Latin America and the Caribbean than they did in this country. Over the 12-year period 1991-2002, the global mining industry invested more than US$7.2 billion (current dollars) in mineral exploration in Latin America and the Caribbean. Companies listed on Canadian stock exchanges made one third of that investment.[38]

In 2004, Canadian companies held 35% of the larger-company mineral exploration market in Latin America and the Caribbean, up from 29% the previous year. The Canadian share is the largest, by far, of all international competitors in the region and is roughly $50 million more than domestic companies planned to spend there. The share of the exploration market held by local companies in the region stood at 30% in 2004. In contrast, in 1994, local companies held less than 14% of the market. However, their share has generally been rising each year since then.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in almost 1200 mineral properties in Latin America and the Caribbean, about 160 more than in 2003. Since 1996, the number of mineral property interests held by Canadian companies in the region has exceeded the number held in the United States (**Figure 48**).

3.7.2.1 Mexico

In 2004, the larger-company mineral exploration market in Mexico was valued at $146 million, or roughly 4% of the $3.7 billion larger-company market worldwide. Larger-company budgets for Mexico were roughly $50 million more than those of the previous year.

Mexico is one of the relatively few countries where domestic companies carry out a significant proportion of mineral exploration programs, even if it is not the dominant share. Together the Mexican companies Industrias Peñoles, S.A. de C.V. and Grupo México were expected to spend about $55 million. This represents almost 40% of the exploration programs planned for that country during 2004.

In 2004, Mexico ranked second in Latin America, and sixth in the world, in terms of countries where Canadian companies are the most active in mineral exploration (**Figure 51**). Twelve of the larger Canadian-based companies planned exploration programs for Mexico during 2004. These companies were expected to spend, in total, $70 million, which represents almost half of the larger-company market in that country.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in about 340 mineral properties in Mexico, about 60 more than at the end of 2003.[39]

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[38] André Lemieux, *Attracting International Mineral Exploration: The Competitive Position of Peru*, unpublished paper, Natural Resources Canada, Ottawa, March 2002, 37 pp.

[39] For the geographic distribution, by state, of mineral properties in which Canadian companies have an interest in Mexico, see André Lemieux, "Canada's Global Mining Presence," in the 2000 edition of the *Canadian Minerals Yearbook*, Natural Resources Canada, Ottawa, pp. 7.7 and 7.8 (www.nrcan.gc.ca/mms/cmy/content/08.pdf).

3.7.2.2 South America

In 2004, the larger-company mineral exploration market in South America was valued at $654 million, or almost 18% of the $3.7 billion larger-company market worldwide. Thirty-three of the larger Canadian-based companies planned to spend, in total, $211 million in the region, about $70 million more than during the previous year. Their programs accounted for 32%, and the largest share, of all larger-company mineral exploration activity planned there.

Canadian companies held the dominant share of the larger-company mineral exploration market in Argentina, Bolivia, Colombia, Ecuador, French Guiana, Guyana, Peru and Surinam. Peru, Brazil, Argentina and Chile rank fifth, ninth, eleventh and twelfth, respectively, in the world in terms of countries where Canadian companies are the most active in mineral exploration (**Figure 51**).

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in 715 mineral properties throughout South America, about 85 more than at the end of the previous year. They held interests in 170 properties in both Argentina and Peru, in 110 in Brazil, in more than 90 in Chile, in more than 40 in Venezuela, and in roughly 30 in each of Bolivia and Ecuador.

3.7.2.3 Central America

In 2004, the larger-company mineral exploration market in Central America was valued at $26 million, or less than 1% of the $3.7 billion larger-company market worldwide. The larger Canadian-based companies planned to spend $16 million in the region.

Central America is one of the regions of the world where the smaller companies, and those based in Canada in particular, account for a substantial proportion of the mineral exploration activity that usually takes place there. In 2004, the smaller Canadian-based companies were expected to account for roughly 70% of the $10 million smaller-company exploration market in that region.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in roughly 100 mineral properties throughout Central America. They held interests in more than 25 in Honduras, in 20 in each of Nicaragua and Guatemala, and in 10 or more in each of El Salvador and Panama.

3.7.2.4 Caribbean

In 2004, the larger-company mineral exploration market in the Caribbean was valued at roughly $8 million, or less than 1% of the $3.7 billion larger-company market worldwide. Canadian-based companies were expected to undertake almost all of the larger-company exploration programs planned for the region.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in roughly 40 mineral properties in the Caribbean, about 30 of them in the Dominican Republic.

3.7.3 Europe and the Former Soviet Union

In 2004, the larger-company mineral exploration market in Europe and the former Soviet Union was valued at $337 million (**Figure 49**), or roughly 9% of the $3.7 billion larger-company market worldwide. From 2003 to 2004, the market in the region grew by almost $150 million. The larger Canadian-based companies planned to spend $76 million in the region, equivalent to 23% of the market there and roughly double the amount that they planned to spend there the previous year.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in roughly 230 mineral properties in Europe and the FSU (**Figure 48**).

3.7.3.1 Western Europe

In 2004, the larger-company mineral exploration market in western Europe was valued at $84 million, or roughly 2% of the $3.7 billion larger-company market worldwide. The larger Canadian-based companies planned to spend about $4 million in the region, equivalent to 5% of the market.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in more than 120 mineral properties in western Europe. They held interests in roughly 30 in Sweden and in 15 or more in each of Finland and Spain.

3.7.3.2 Eastern Europe

In 2004, the larger-company mineral exploration market in eastern Europe was valued at roughly $22 million, or less than 1% of the $3.7 billion larger-company market worldwide. The larger Canadian-based companies planned to spend about $10 million in the region, equivalent to roughly 45% of the market there.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in over 70 mineral properties in eastern Europe. They held interests in more than 40 properties in Turkey and in roughly 10 in each of Greece and Romania.

3.7.3.3 Former Soviet Union

In 2004, the larger-company mineral exploration market in eight countries of the FSU was valued at $221 million,[40] or 6% of the $3.7 billion larger-company market worldwide. From 2003 to 2004, the market in the FSU grew by over $130 million. The larger Canadian-based companies planned to spend $61 million in the FSU, more than double what they planned to spend in 2003.

In Russia, the larger Canadian-based companies planned to spend more than $50 million, up by $30 million compared with 2003. These Canadian programs for Russia in 2004 were equivalent to 27% of the market in that country.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in roughly 40 mineral properties in six countries of the FSU. The number of properties in which they held interests in Russia stood at roughly 15.

3.7.4 Africa and the Middle East

In 2004, the larger-company mineral exploration market in Africa and the Middle East was valued at $657 million (**Figure 49**), or roughly 18% of the $3.7 billion larger-company market worldwide. For the second year in a row, substantial growth occurred in the market for exploration in the region. From 2003 to 2004, exploration budgets for the region grew by over $190 million, or by over 40%. Africa accounts for almost all of the mineral exploration market in Africa and the Middle East.

3.7.4.1 Africa

In 2004, the larger-company mineral exploration market in Africa was valued at $655 million, or almost 18% of the $3.7 billion larger-company market worldwide. The larger Canadian-based com-

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[40] The size of the mineral exploration market in certain regions of the world is underestimated because there are few data available on the extent of exploration programs undertaken by some private enterprises and state agencies.

panies planned to spend $104 million in Africa, equivalent to roughly 16% of the larger-company market on that continent. From 2003 to 2004, the larger Canadian-based companies more than doubled their budgets for Africa.

The larger Canadian-based companies planned to spend $26 million in Tanzania. That nation ranked 10th in the world in terms of countries where Canadian companies are the most active in mineral exploration.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in over 600 mineral properties located in 33 countries on the African continent. From 2003 to 2004, the number of properties in which they held interests grew by about 40. Canadian companies held interests in over 90 properties in South Africa; in more than 50 in each of Burkina Faso, Mali, Ghana and Tanzania; and in more than 20 in each of Guinea, Madagascar, Zambia and Zimbabwe.

3.7.4.2 Middle East

In 2004, the larger-company mineral exploration market in the Middle East was valued at $2 million. None of the larger Canadian-based companies planned to explore in that region of the world.

3.7.5 Asia-Pacific

In 2004, the larger-company mineral exploration market in Asia-Pacific was valued at $863 million (**Figure 49**), or 23% of the $3.7 billion larger-company market worldwide. From 2003 to 2004, the market for exploration in the region grew by $350 million. The larger Canadian-based companies planned to spend $278 million in Asia-Pacific, equivalent to more than 32% of the market there and roughly double what they planned to spend in 2003.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in over 480 mineral properties in Asia-Pacific (**Figure 48**), about 100 more than at the end of the previous year.

3.7.5.1 Southeast Asia

In 2004, the larger-company mineral exploration market in Southeast Asia was valued at $136 million, or roughly 4% of the $3.7 billion larger-company market worldwide.

The larger Canadian-based companies planned to spend $11 million in the region, equivalent to 8% of the market there. Canadian budgets for individual countries were relatively small and no single company planned to spend more than $5 million in any given country of the region during 2004.

At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in roughly 140 mineral properties in Southeast Asia, about the same number as at the end of the previous year. They held interests in about 50 properties in Indonesia and in more than 40 properties in the Philippines.

3.7.5.2 East Asia

In 2004, the larger-company mineral exploration market in east Asia, which includes China, Japan, Mongolia and South Korea, was valued at $212 million,[40] or roughly 6% of the $3.7 billion larger-company market worldwide. From 2003 to 2004, the market in east Asia grew by $158 million. The larger Canadian-based companies planned to spend $167 million in the region, equivalent to almost 80% of the market and about four times what they planned to spend in 2003.

Since the early 1990s, there has been considerable interest in the mineral potential of China. More recently, the significant growth in demand occurring in that country for many mineral commodities

has provided an even greater impetus for mining companies to explore there, especially for those companies based in Canada. In 2004, 21 of the 39 companies of all sizes that planned to explore for minerals in China were based in this country.

In late 2004, companies of all sizes listed on Canadian stock exchanges held interests in almost 160 mineral properties in East Asia. As a result of growing interest in the region, the number of properties in which they hold interests increased by 70 compared with the previous year. They held interests in almost 100 properties in China and in almost 60 in Mongolia.

3.7.5.3 South Pacific

In 2004, the larger-company mineral exploration market in the South Pacific was valued at $494 million, or more than 13% of the $3.7 billion larger-company market worldwide. From 2003 to 2004, the market in the South Pacific grew by over $130 million. The larger Canadian-based companies planned to spend $100 million in the South Pacific, about the same as in 2003 and equivalent to 20% of the market in the region. Australia ranks fourth in the world in terms of countries where the larger Canadian-based companies are the most active in mineral exploration (**Figure 51**). At the end of 2004, companies of all sizes listed on Canadian stock exchanges held interests in almost 180 properties in the South Pacific, 25 more than at the end of the previous year. More than 90% of the properties in which Canadian companies have an interest in the region are located in Australia.

3.7.5.4 South Asia

In 2004, the larger-company mineral exploration market in South Asia, which includes India, Pakistan and Sri Lanka, was valued at $16 million, or less than 1% of the $3.7 billion larger-company market worldwide. The larger Canadian-based companies reported no exploration programs or property holdings in that region of the world.

3.8 SUMMARY AND OUTLOOK

The year 2004, much like the one prior, was very conducive to the financing of mining companies, particularly those based in Canada. Roughly half of the $11.4 billion in equity capital raised globally during the year for mineral exploration and development projects worldwide was for the projects of companies listed on Canadian stock exchanges.

In 2004, the global market for mineral exploration grew to $5.0 billion, up (in constant dollars) from $3.6 billion the previous year. Indicators of exploration activity were up almost everywhere. During the year, the larger Canadian-based companies (those that budgeted to spend at least $4 million to look for minerals) planned to undertake programs valued at more than $1.4 billion in Canada and elsewhere around the world. Compared with 2003, their exploration budgets increased by $590 million. Almost 60% of the 1134 companies of all sizes that planned to undertake mineral exploration programs during 2004 were based in this country.

The share of the global exploration market held by the larger Canadian-based companies rose from 33% in 2003 to 38% in 2004. In comparison, the larger companies based in South Africa held 15% of the global market, those based in Australia and in Europe each held 13%, and those based in the United States held 11%. As a group, the larger Canadian-based companies allocated, proportionately, much more of their exploration programs to gold than the worldwide industry average. However, they allocated, proportionately, much less to diamonds and PGMs.

From 2003 to 2004, the value of the larger-company mineral exploration market in Canada grew from $453 million to $622 million. Some 17% of all the mineral exploration programs planned by the world's larger companies were expected to be conducted in Canada. As in the previous two

years, Canada, in 2004, remained the country where the world's mining companies were the most active in mineral exploration.

The number of mineral properties in which companies of all sizes listed on Canadian stock exchanges held interests grew by more than 700 during 2004. As a result, at the end of that year, Canadian companies held interests in a portfolio of more than 7100 mineral properties worldwide. About 3200 of these properties were located abroad, dispersed in over 100 countries.

The larger Canadian-based companies allocated almost $485 million to exploration programs in Canada during 2004, or more than one-third of their total budgets and about the same proportion as in the previous year. Foreign companies allocated a further $138 million to programs in Canada, about 80% of it to look for diamonds. The largest individual company mineral exploration budgets for Canada were those of foreign-based companies. Nonetheless, Canada remains one of the few countries where the domestic industry consistently dominates mineral exploration activity year after year.

The larger Canadian-based companies allocated almost $929 million to exploration programs outside Canada in 2004; this compares with $534 million in 2003. Seventy-four of the 105 larger Canadian-based companies planned to be active abroad; about half of these 105 companies planned to explore only outside Canada and about 10% of them planned to explore simultaneously in five or more countries. The larger Canadian-based companies were expected to carry out the dominant share of the exploration programs not only in this country, but also in the United States, Mexico, South America, Central America, the Caribbean, and East Asia.

Some countries in Asia are growing in importance as potential new sources of large quantities of mineral materials. During 2004, the market for mineral exploration grew considerably in China and Mongolia. Companies based in Canada held the dominant share of the mineral exploration market in both of these countries. Twenty-one of the 39 companies of all sizes that planned to explore for minerals in China in 2004 were Canadian. Even though Canadians are almost ubiquitous in their exploration activities, Canada, nonetheless, remains the country where they continue to be, by far, the most active in mineral exploration.

Although the focus here is on the exploration activities of the world's larger companies, the smaller companies (those that budgeted at least $133 000, but less than $4 million, to look for minerals during 2004) are an important and essential component of exploration and development in many regions of the world, but especially in Australia and Canada. The smaller companies are of particular significance to many developing nations. In 2004, there were 25 such countries where the smaller companies were the only ones conducting commercial mineral exploration programs.

The smaller Canadian-based companies planned to spend $608 million on mineral exploration worldwide in 2004, $303 million of it looking for minerals in this country. In the case of Canada, adding the budgets of the smaller companies to those of the larger ones raises the proportion of all global exploration programs planned by Canadian-based companies in 2004 to 43% of world activity; it also raises the proportion of all of the world's mineral exploration programs expected to take place in this country to roughly 20%.

In 2005, the market for mineral exploration is likely to have grown by almost 40% compared with the size of the market in 2004. Although Canadian companies tend, on average, to have smaller exploration budgets than their competitors, they are considerably more numerous than companies based elsewhere. As a result, Canadian companies are likely to have dominated global mineral exploration again in 2005 and they are likely to continue do so for the foreseeable future.

APPENDIX 1

Historical Exploration and Deposit Appraisal Statistics

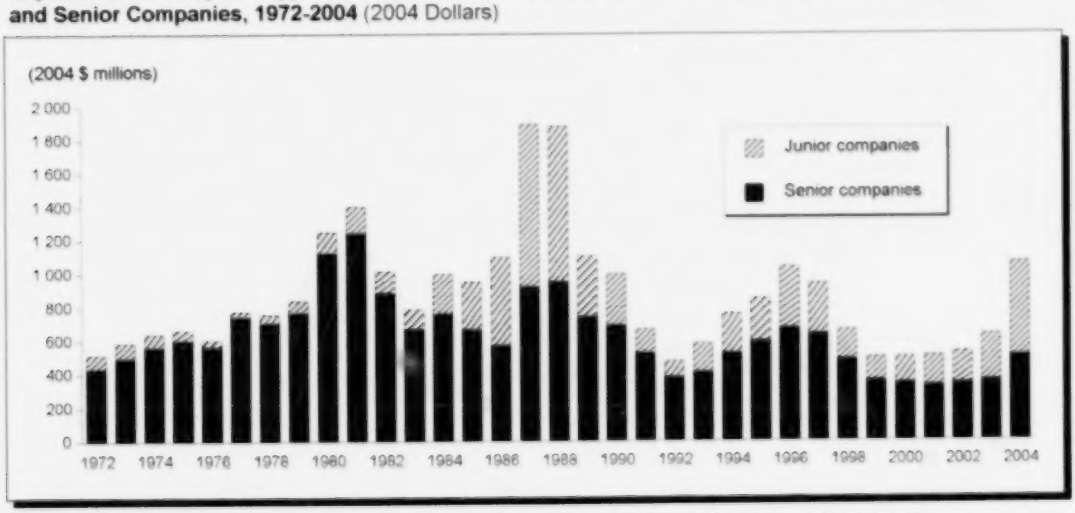
INTRODUCTION

Appendix 1 contains data and analyses that are based on the pre-1997 survey definitions when only field and overhead costs were considered. While more restricted by this measure of exploration and deposit appraisal activity, the data are available over a much longer time period. The resulting time series provides a useful statistical tool for studying historical trends in Canadian mineral exploration spending.

HISTORICAL SUMMARY

Figure 53 depicts Canadian exploration and deposit appraisal expenditures (field and overhead costs only) in constant 2004 dollars over the period 1972 to 2004. Above-normal expenditures in the

Figure 53
Exploration and Deposit Appraisal Expenditures (1) **(Field Work and Overhead) in Canada by Junior and Senior Companies, 1972-2004** (2004 Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(1) Includes on-mine-site and off-mine-site activities.
Notes: Total expenditures for 1975-81 are overstated by an average of about 17% relative to earlier and later years because of changes to the methodology used by Statistics Canada over the years. Data for 2004 are final. Expenditures for 1997 to 2004 include both exploration and deposit appraisal costs as per the new survey definitions; up to and including 1996, most of the expenditures now included in the deposit appraisal phase were reported under "exploration."

1980-82 period resulted from high prices for gold, silver and copper over much of that period. Spending declined somewhat in 1983, but generally rose from 1984 to 1988 as a result of the introduction by the federal government, in 1983, of the Mining Exploration Depletion Allowance (MEDA). MEDA was replaced in 1989 and 1990 by the Canadian Exploration Incentive Program (CEIP). By 1987 and 1988, expenditures had reached unprecedented high levels because of MEDA and the high gold prices that had prevailed until the end of 1987. However, spending fell dramatically after 1988 and decreased until 1992 when it reached its lowest inflation-adjusted level since 1966.

Activity picked up gradually in the 1993-96 period. Expenditures increased by 118% from 1992 to 1996 and the 1996 level of $1039 million (2004 dollars) was the highest since 1989. Although exploration and deposit appraisal spending declined to $941 million (2004 dollars) in 1997, it still remained relatively strong by historical standards. However, spending dropped significantly in 1998 to $663 million (2004 dollars), a decline of 30% from 1997. At $496 million, the 1999 total represents a further drop of 25% from the 1998 level and represented the second lowest total in almost the past four decades. The recovery began almost imperceptibly in 2000 when field and overhead spending increased by $2 million and gathered a little momentum in 2001 with a further gain of $7 million to reach $505 million. Data on field and overhead spending for 2002 and 2003 show a continued strengthening of field and overhead expenditures with spending totals of $529 million and $632 million, respectively.

Returning to 1992, the relatively higher expenditure levels that were recorded in ensuing years resulted, to a great extent, from important discoveries of diamond deposits. These discoveries led companies to invest vast sums of money in advanced exploration or deposit appraisal projects and in mine development activities. As indicated in Chapter 1 of this report, over $2 billion (constant 2004 dollars) has been spent on the search (exploration and deposit appraisal only) for diamonds since 1993.

Another major contributor was the late-1994 nickel-copper-cobalt discovery at Voisey's Bay, Labrador, a result of exploration for diamonds in that area, which attracted a lot of attention, especially from junior exploration companies. The resulting flurry of exploration and deposit appraisal activity in the area also had a strong impact on expenditures, particularly in 1995 and 1996. The Voisey's Bay project shipped its first nickel concentrate on November 16, 2005, eleven years after the initial discovery. The annual production capacity of Phase One of the Voisey's Bay project is expected to be 110 million pounds of nickel in concentrate containing 5 million pounds of cobalt and up to 15 million pounds of copper. Phase One of the project will also produce copper concentrate containing approximately 70 million pounds of copper in concentrate annually.

A combination of factors took over after 1997 to bring Canadian mineral exploration and deposit appraisal activity to dangerously low levels where both the resilience of the Canadian junior mining sector and the ore-reserve sustainability of a number of mineral producers were tested. Metal prices, as explained below, constituted the primary factor. Generally low demand for metals was excacerbated by worldwide economic events, including the Asian financial crisis and the September 2001 terrorist attacks in the United States, and companies, especially juniors, had plenty of difficulty in raising exploration funds in the wake of corporate scandals like the Bre-X affair.

In this generally negative context, the introduction by the federal government and by some provincial/territorial governments of exploration tax credits and other measures was welcome news and contributed, along with a rapidly improving metals price outlook and continued success in the search for diamonds, to the recovery that began so timidly in 2000, that was confirmed in 2003, and that then blossomed into the banner years of 2004 and 2005.

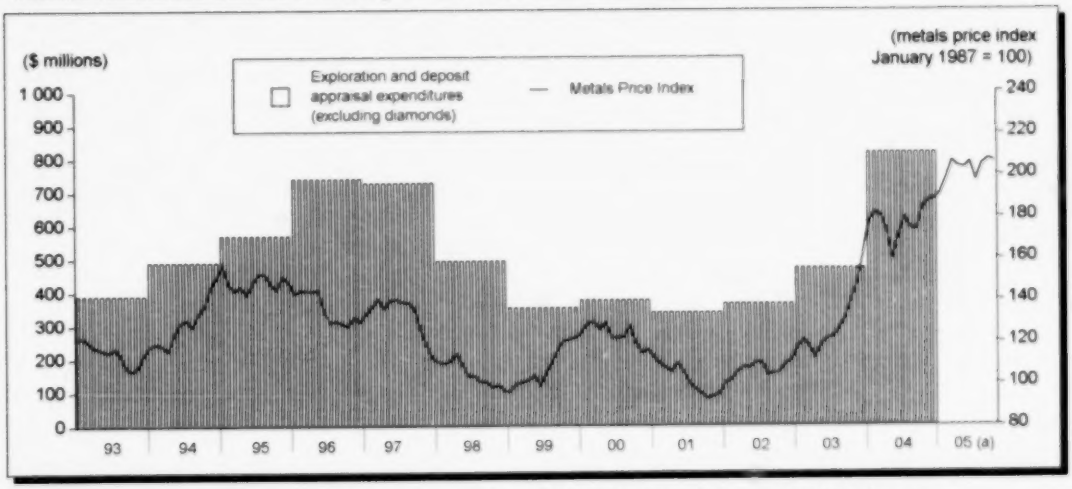
METAL PRICES AND EXPLORATION AND DEPOSIT APPRAISAL LEVELS

Under normal circumstances, metal prices are probably the most important factor influencing the level of exploration and deposit appraisal activity. For example, between 1993 and 1995, copper, nickel and lead prices increased by over 60% while zinc and gold prices increased by 14%. Over the same period, field and overhead exploration and deposit appraisal spending (excluding diamonds-related spending and in current dollars) increased by 45%.

In early 1995, metal prices embarked on a downward trend as reflected by Natural Resources Canada's Monthly Metals Price Index (**Figure 54**). After peaking in January 1995, the index began a generally decreasing trend and had fallen by 39% by January 1999, when it reached its lowest level since at least January 1989. The index generally increased from January 1999 to March 2000 when it stood about 35% above the level of January 1999. It then began a downward trend and, in October 2001, following the September 2001 terrorist attacks in the United States and amid generally low metal prices, the Index dropped to a new low. The recovery that began afterwards picked up considerable steam in the second half of 2003 and continued towards new heights in 2004, especially in the latter part of the year. In 2005, the NRCan Monthly Metals Price Index really took off, reaching a historical high in December, at a level that even surpassed those recorded in the 1987-88 period. The respective prices of all of six individual metals in the index were showing strength at the end of 2005 with monthly average prices for zinc and nickel at 15- and 16-year highs, for gold and lead at 25-year highs, and for copper at all-time record levels, in nominal dollar terms.

As outlined in previous editions of this report, there is a relationship between the level of spending in a particular year and metal prices in earlier years. The decreasing trend in metal prices that began in 1995 was not reflected in spending levels before 1997, partly because of that relationship and partly because of the expenditures on the search for diamonds, which added an element of stability to exploration and deposit appraisal levels. When excluding diamonds, expenditures (field and overhead costs only) peaked in 1996, started declining in 1997, fell even more in 1998 and 1999, were mostly stable but low in the 2000-2002 period, and began to recover in 2003. They exploded in

Figure 54
Exploration and Deposit Appraisal Expenditures (Field Work and Overhead) in Canada, and Natural Resources Canada's Monthly Metals Price Index, 1993-2005 (Current Dollars)



Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
(a) At press time, no data were available for field and overhead costs in 2005.
Notes: Exploration and deposit appraisal data up to 2004 are final. For comparison with pre-1997 years, the data include only field and overhead expenditures.

2004 after the price outlook really showed signs of improving in the second half of 2003. This relationship outlines the importance of improving metal prices in enticing higher exploration and deposit appraisal spending levels and, based on the current strength in metals prices, provides for a positive short-term outlook.

EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES BY JUNIOR COMPANIES

As shown in **Figure 53**, junior companies have traditionally played an important role in Canadian mineral exploration and deposit appraisal activity. However, their contribution really expanded in 1984, a year after the introduction of MEDA, when their spending accounted for almost 24% of total exploration and deposit appraisal expenditures. That proportion had more than doubled by 1987 when junior companies accounted for $973 million (2004 dollars), or 51% of the total of $1.89 billion spent during that year. Junior spending was also very important in 1988 with almost 50% ($930 million) of total expenditures. Their proportion of total spending then started to gradually decrease until it reached 21% in 1992.

The levels of spending recorded by junior companies in the 1986-88 period are even more impressive when taking into account the fact that, during that period, considerable contributions were made by junior companies to joint-venture projects operated by senior companies. In the survey, these contributions were counted as part of senior companies' spending, thus overstating senior expenditures and understating junior expenditures.

On a yearly basis, junior spending accounted for approximately 30% of total expenditures (field work and overhead only) over the period 1993-2000. The discovery of diamonds in Canada's North and of nickel-copper-cobalt at Voisey's Bay were the two most important positive factors affecting junior spending during those years. Low metal prices, a slowing world economy and difficulties in raising financing explain the more difficult years. The introduction of the federal Investment Tax Credit for Exploration (ITCE) in October 2000 and related provincial tax credits, around that time and subsequently, was favourable to junior mining companies as their expenditures started to recover faster than those of senior companies. This recovery in junior spending was strong enough to increase their share of total spending (field and overhead costs) to almost 44% in 2003. The momentum continued to build in 2004 as junior mining companies accounted for 53% of all spending, the first time since 1987 (and only the second time in the history of Canadian mineral exploration statistics) that junior spending exceeded that of senior companies. As explained in Chapter 1 of this report, junior company spending was buoyed by strong metal prices and the eagerness of financial markets to fund mineral exploration activity in 2005 and, as a result, continued to surge at a much faster pace than the expenditures of senior companies.

EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES BY PROVINCE AND TERRITORY

Tables 27 and **28** show exploration and deposit appraisal expenditures (field and overhead costs only) by province and territory in terms of current dollars and 2004 constant dollars. Both tables cover the period 1990 to 2004, which includes the period when MEDA was replaced by CEIP, the difficult period that led to the trough of 1992, the exciting discoveries of 1993 and 1994, and the ensuing increase in spending up to 1996, the downward trend that has brought exploration and deposit appraisal spending down to an almost historical low in 1999, and the latest upward trend that began so slowly in 2000 and has taken expenditures to record levels in 2004.

TABLE 27. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES (FIELD WORK AND OVERHEAD) IN CANADA, BY PROVINCE AND TERRITORY, 1990-2004 (CURRENT DOLLARS)

Province/Territory	Total Exploration and Deposit Appraisal (1)														
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	($ millions)														
Newfoundland and Labrador	23.3	12.1	11.1	8.9	12.4	71.1	92.5	58.4	40.8	29.3	23.1	20.7	24.0	21.5	30.5
Nova Scotia	11.0	4.5	3.3	1.8	1.7	2.8	6.9	6.7	4.8	3.6	3.0	1.5	1.8	4.0	6.9
New Brunswick	16.5	15.8	12.2	11.1	10.0	12.7	14.8	12.2	10.0	10.0	12.0	9.4	3.2	2.5	13.2
Québec	196.4	138.1	94.1	106.1	130.3	123.4	137.2	168.6	123.5	103.4	89.9	94.8	104.0	128.0	209.4
Ontario	152.6	109.7	77.4	75.6	113.0	129.7	194.9	176.5	111.3	81.1	113.7	110.2	121.0	187.4	271.1
Manitoba	41.2	29.7	32.0	27.4	40.5	32.6	41.2	40.3	29.5	22.6	27.7	28.5	29.6	27.0	35.7
Saskatchewan	42.2	31.5	25.9	53.1	50.6	43.8	50.6	49.9	57.8	36.0	40.0	34.4	35.2	43.6	63.3
Alberta	10.7	6.6	5.4	7.3	9.4	10.6	10.8	20.5	21.6	11.4	6.1	4.3	5.6	4.6	4.3
British Columbia	226.5	135.7	71.6	66.0	85.0	79.4	104.9	95.8	44.3	33.4	29.9	25.6	34.5	52.6	130.6
Yukon	18.4	16.5	9.7	19.2	25.7	39.3	46.4	40.6	17.5	12.2	9.9	7.3	7.4	11.9	20.8
Northwest Territories	36.0	31.6	42.7	100.7	149.5	172.2	194.5	150.7	114.8	61.0	45.3	75.2	59.8	45.7	99.6
Nunavut	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	33.8	57.4	58.1	71.3	85.3	177.7
Total field work (excluding overhead)	660.3	439.2	323.5	410.1	540.5	608.1	835.9	749.5	522.4	387.6	412.3	415.8	434.8	552.7	966.7
Total exploration and deposit appraisal (including overhead)	774.7	531.8	385.3	477.3	628.1	717.6	894.8	820.2	575.9	437.9	458.1	470.1	497.2	614.2	1 063.0

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
n.a. Not applicable.
(1) For comparison with pre-1997 years, the data include only field and overhead expenditures. They do not include other related expenditures such as those for engineering, environment and land access.
Notes: Numbers may not add to totals due to rounding. Data are final.

TABLE 28. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES (FIELD WORK AND OVERHEAD) IN CANADA, BY PROVINCE AND TERRITORY, 1990-2004 (2004 DOLLARS)

Province/Territory	Total Exploration and Deposit Appraisal (1)														
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	(2004 $ millions)														
Newfoundland and Labrador	30.1	15.2	13.8	10.9	15.0	83.9	107.4	67.0	47.0	33.2	25.1	22.2	25.5	22.2	30.5
Nova Scotia	14.2	5.6	4.0	2.2	2.1	3.4	8.0	7.7	5.6	4.1	3.2	1.7	1.9	4.1	6.9
New Brunswick	21.3	19.8	15.1	13.5	12.1	15.0	17.2	13.9	11.5	11.3	13.1	10.1	3.4	2.6	13.2
Québec	253.4	173.1	116.4	129.4	157.2	145.6	159.3	193.4	142.3	117.0	97.7	101.9	110.7	131.8	209.4
Ontario	196.9	137.5	95.8	92.2	136.3	153.1	226.3	202.4	128.1	91.9	123.7	118.5	128.7	192.9	271.1
Manitoba	53.2	37.2	39.5	33.5	48.9	38.5	47.9	46.2	33.9	25.6	30.1	30.6	31.5	27.8	35.7
Saskatchewan	54.4	39.5	32.0	64.8	61.0	51.7	58.7	57.3	66.6	40.7	43.5	37.0	37.5	44.9	63.3
Alberta	13.8	8.3	6.7	8.9	11.4	12.5	12.6	23.5	24.8	12.9	6.6	4.6	6.0	4.8	4.3
British Columbia	292.2	170.1	88.6	80.5	102.5	93.7	121.7	109.9	51.0	37.8	32.6	27.5	36.7	54.2	130.6
Yukon	23.7	20.7	12.0	23.4	31.0	46.4	53.8	46.6	20.2	13.8	10.8	7.8	7.9	12.3	20.8
Northwest Territories	46.4	39.6	52.9	122.9	180.3	203.2	225.8	172.9	132.2	69.0	49.3	80.9	63.6	47.0	99.6
Nunavut	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	38.3	62.4	62.5	75.9	87.9	177.7
Total field work (excluding overhead)	851.9	550.6	400.2	500.4	651.9	717.6	970.4	859.7	601.5	438.9	448.2	447.0	462.6	569.0	966.7
Total exploration and deposit appraisal (including overhead)	999.5	666.6	476.8	582.4	757.6	846.8	1 038.7	940.7	663.2	495.8	498.0	505.3	529.0	632.3	1 063.0

Source: Natural Resources Canada, based on the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures.
n.a. Not applicable.
(1) For comparison with pre-1997 years, the data include only field and overhead expenditures. They do not include other related expenditures such as those for engineering, environment and land access.
Notes: Numbers may not add to totals due to rounding. Data are final.

APPENDIX 2

Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures

HISTORY OF CANADIAN EXPLORATION STATISTICS

In Canada, mineral exploration statistics have been collected, in one form or another, since 1946. From 1946 to 1963, Statistics Canada compiled "cost of prospecting" data for metal mines for Canada and the provinces. Companies were surveyed from 1964 to 1966, but the data were not compiled. However, using the filled-out survey questionnaires for those three years, Natural Resources Canada (NRCan) was able to estimate expenditures for that period. From 1967 to 1987, Statistics Canada compiled and published both mine-site and general exploration expenditures, as well as mine-site development expenditures and other capital and repair expenditures. From 1985 to 1987, NRCan collected detailed field work expenditures. Since 1988, NRCan has been fully responsible for the survey of non-producing entities that have any type of exploration expenses. Statistics Canada continued to survey producing firms until 1997.

A review of survey definitions was carried out in the mid-1990s to improve the quality of the survey. This revision was undertaken by the Federal-Provincial Committee on Mineral Statistics, in consultation with industry, and completed in 1997. The resulting Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures was designed to better describe the full mineral development cycle (**Table 29**) and to provide more comprehensive measures of investment in the Canadian minerals and metals industry. Statistics from this survey include detailed information on feasibility studies and other more technically related costs that were previously excluded. The redesigned survey also provides a clearer distinction between the primary exploration and deposit appraisal phases, and additional information on associated environmental costs. Since 1997, NRCan has been fully responsible for the coordination of the federal-provincial/territorial preliminary and forecast survey, and partially responsible for the annual survey for both non-producing and producing firms.

SURVEY PROCESS

Two questionnaires are distributed each year. For example, for the survey period 2004/05, the *2004 preliminary estimate* and *2005 intentions* survey was conducted during the last quarter of 2004 and compiled in January 2005. The more detailed *final* survey questionnaires for 2004 were distributed in early 2005. The results of this *final* survey were compiled during the course of 2005. A *revised forecast* survey was also conducted during the course of 2005 by contacting the project operators who had reported spending intentions in the *2004 preliminary estimate* and *2005 intentions* survey and those that had failed to do so. The *preliminary estimate* and *intentions* survey usually provides preliminary results on the year in which the survey was conducted and a forecast for the coming year that is based on company spending intentions. The *final* survey provides a wealth of project-specific information, including the types of commodities explored for, the type of field work undertaken, related overhead expenditures, the type of company involved, joint-venture partners, and other details.

TABLE 29. GENERALIZED MODEL OF THE MINERAL RESOURCE DEVELOPMENT AND MINING PROCESS

PHASE	MINERAL RESOURCE ASSESSMENT	MINERAL EXPLORATION					MINERAL DEPOSIT APPRAISAL				MINE COMPLEX DEVELOPMENT	MINE PRODUCTION	ENVIRON-MENTAL RESTORATION
		GRASS-ROOTS EXPLORATION											
	MRA	EX-1	EX-2	EX-3	EX-4	EX-5	DA-1	DA-2	DA-3	DA-4	MCD	MP	ER
STAGE	Various surveys, research and synthesis.	Exploration planning.	Regional reconnaissance and surveys.	Prospecting and ground surveys of anomalies.	Verification of anomalies and showings.	Discovery and delimitation of a mineral deposit.	Mineral deposit definition.	Project engineering.	Project economics.	Feasibility study, production decision.	Mine development, construction of processing plant and infrastructure.	Production, marketing and renewal of reserves.	Mine complex closure and decommissioning, site restoration.
OBJECTIVES	Supply information and tools required to develop the mineral potential of the nation for economic benefit, in the perspective of sustainable development.	Select target commodities. Establish exploration objectives and strategies. Select target areas and sites. Acquire claims or permits if appropriate.	Seek anomalies of interest over wide areas by various survey methods. Select the more promising targets. Acquire claims or permits.	Confirm the presence, exact location and characteristics of anomalies. Acquire claims, leases and properties.	Investigate the cause of anomalies. Find mineral showings. Acquire additional claims, leases and properties.	Discover, delimit and interpret grade, quality and tonnage of a new mineral deposit. Determine if it constitutes a mineral resource of "potential economic interest" to justify more intensive and detailed work.	Define the limits, controls and internal distribution of grades, mineralogy and mineral processing characteristics of the depo-sit. Acquire all data required for project enginee-ring and cost estimation.	Determine, in an iterative fashion, the design, plans, schedules, capital cost and operating cost estimates for all aspects of the project. Establish technical feasibility and costs thoroughly and realistically.	Obtain all the information required and determine, based on corporate objectives parameters for the economic, financial and social-political evaluation of the project.	Diligently validate and integrate project data, interpretations, estimations, plans and evaluations to achieve MCD and production objectives. Decide on whether to undertake the mining project. Obtain permits and financing.	Complete mine development and construction on schedule and within budgets and specifications. Ensure efficient and timely mine complex start-up according to schedule, specifications and cash flow forecasts.	Achieve commercial production on schedule and meet cash flow forecasts and quantity and quality specifications. Achieve mine profitability and company survival in the perspective of sustainable development.	Restore mine site, outside plant and infrastructure to environmentally acceptable condition. Ensure the future quality of the environment.
EVALUATION METHODS	Geoscientific, mineral and economic surveys, research, compilations and synthesis by governments, research institutes, universities and industry.	Metal and mineral market research. Review of geological and ore deposit information and of the legal, fiscal and socio-political context in various areas.	Remote sensing, aerial photography and airborne geophysics. Prospecting, geology and geochemistry Appraisal, rating and selection of anomalies.	Ground, geological, geochemical and geophysical prospecting and surveys. Compilation, appraisal and selection of significant anomalies.	Geological mapping and other surveys. Trenching, mapping, sampling, drilling and down-hole geophysics. Initial mineral processing tests. Environmental and site surveys. Mineral resource estimation and inventory.	Stripping, trenching, mapping, sampling, drilling and down-hole geophysics. Initial mineral processing tests. Environmental and site surveys. Mineral resource estimation and inventory.	Detailed mapping, sampling and drilling on surface or from underground. Systematic mineralogy and mineral processing tests. Detailed environmental and site surveys. Pre-feasibility studies.	Pilot tests, engineering design and planning. Capital and operating costs for mining, mineral processing, infrastructure, environmental protection and restoration. Technical risk analysis. Pre-feasibility studies.	Market, prices, product development and financial studies. Environmental, economic, financial, and socio-political risk analysis. Pre-feasibility studies.	Exhaustive due diligence review of all data, interpretations, plans and estimates. Evaluation of profitability, given the geological, technical, financial and qualitative risks, and the up-side factors.	Project management methods in a quality assurance perspective. Training program for personnel and detailed start-up plan to meet the requirements of this demanding period.	Production management methods to ensure continuous quality and efficiency improvements. Exploration, deposit appraisal and development of new zones or deposits on-mine-site and off-mine-site.	Mine closure and decommissioning. Environmental restoration and monitoring.
RESULTS	Maps, data bases, tools and models.	Exploration projects.	Regional anomalies.	Local anomalies.	Mineral showings.	Mineral deposit.	Deposit appraisal project.			Mining project.	Mining complex.	Mineral production.	Restored site.

MINERAL INVENTORY	UNDISCOVERED MINERAL POTENTIAL		INFERRED RESOURCE	DELIMITED MINERAL RESOURCE		MINERAL RESERVE	
	SPECULATIVE	HYPOTHETICAL		INDICATED	INDICATED AND MEASURED	PROVEN AND PROBABLE	
ESTIMATION ERROR (targeted margin of error of tonnage/grade estimates at the 90% confidence level)			± 100%	± 50%	Indicated: ± 50 to ± 30% Measured: ± 20 to ± 10% (often several sample grid dimensions are used in each category)	Proven (feasibility: ± 10%; mining: ± 5%)	
INVESTMENTS	Moderate	Low, but increasing multiple investments.		Larger and increasing multiple investments.		Very large industrial investment.	Full compliance
RISK LEVEL	Low	Very high, but decreasing risk of failure and financial loss.		High, but decreasing risk of failure.		Moderate to low industrial risk.	

Sources: Modified by D.A. Cranstone, A. Lemieux and M. Vallée, February 25, 1994, from M. Vallée, 1992, *Guide to the Evaluation of Gold Deposits*, CIM Special Volume 45, p. 4, and *SOQUEM Annual Report*, 1976-77, pp. 4 and 5. Revised by M. Vallée and G. Bouchard, January 2001.

The questionnaires for the preliminary and forecast survey were distributed in the fall of 2004 and the questionnaires for the final survey were distributed in early 2005. Some companies receive more than one questionnaire depending on the number of provinces/territories in which they are conducting activities. To avoid duplicate reporting, joint-venture participants who are not project operators do not report expenditures on such joint-venture projects. Companies are asked to report expenditures for the calendar year surveyed.

The survey is a full census of all the companies involved in mineral exploration, deposit appraisal and mine complex development in Canada. To protect the confidential data provided by the respondents, only aggregate statistics are released. However, specific information can be added when such information has already entered the public domain.

DEFINITIONS USED IN THE SURVEY

A number of definitions were introduced in the 1997 redesign of the survey to more closely reflect the current realities of Canadian mineral exploration and development activities. These definitions were developed and agreed upon by federal, provincial/territorial and industry representatives, and they were tested by companies that volunteered to ensure their relevance and applicability. The following is a summary of the definitions most referred to in this report. For a more comprehensive list of definitions, along with more complete descriptions, the reader is invited to consult the Reporting Guide for the Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Expenditures. This guide is available from Natural Resources Canada or from provincial/territorial survey partners.

Mineral Development Phases (Work Phases)

Exploration expenditures represent all field activities, including capital, repair and maintenance expenditures, carried out (on- or off-mine-site) to search for, discover and carry out the first delineation of a previously unknown mineral deposit to establish its potential economic value (tonnage and grade) and to justify further work.

Deposit appraisal expenditures represent all field activities, as well as capital, repair and maintenance expenditures, carried out (on- or off-mine-site) to bring a delineated deposit to the stage of detailed knowledge required for a feasibility study to justify and support a production decision and the investment required.

Mine complex development expenditures include all mine development, capital (construction, machinery and equipment), repair and maintenance expenditures carried out on a mine property that is in production or committed to production.

Mine development expenditures include all activities carried out on a property that is in production or committed to production to define, block out, and gain access to the ore and prepare it for production. Mine development also includes drilling, rock work and support to extend the current ore reserves.

Location of Activity

On-mine-site expenditures represent all field activities and capital, repair and maintenance expenditures applied to exploration or deposit appraisal for an additional mineral deposit separate from the current mine reserves and located strictly on an existing mine site in production or committed to production.

Off-mine-site expenditures represent all field activities and capital, repair and maintenance expenditures applied to exploration or deposit appraisal that are not located on a mine site that is

in production or committed to production. Off-mine-site includes the sites of temporarily or permanently closed mines and advanced projects not yet committed to production.

A *mine site* is an area than can be accessed and exploited from the current or committed installations; hence, the size of this area will vary depending on the commodity under consideration, attitude (horizontal vs. vertical), type and extent of the deposit(s), and the mining method(s) in use.

For a mine site to be *committed to production*, all of the following criteria must be met: (i) a production feasibility study has been completed; (ii) a formal production decision has been reached by the organization; (iii) the necessary financing is on hand or has been arranged; (iv) all required authorizations and permits have been obtained; and (v) major pieces of production equipment have been purchased or ordered.

Surface and Underground Field Surveys and Work (Includes Field Overhead)

Surface and underground field surveys and work includes expenditures associated with geoscientific surveys, drilling, rock work, other field costs, and engineering, economic and feasibility studies. It includes wages, salaries, fringe benefits, food, accommodation and other services, equipment rentals, all vehicle expenses, transportation costs (for people and equipment), and all related technical activities/services such as planning, data collection, interpretation, mapping and reports. The costs incurred by the project operator and contractor(s), as well as field supervision and management costs, are also included. All surveys and work done for environmental purposes are entered under the environment section. This would apply, for example, to geochemical or geophysical surveys performed to characterize or monitor the environment.

Engineering studies include all expenditures related to the additional studies, tests and pilot work (mining, mineral processing, metallurgy, dewatering, etc.), plans, designs and appraisals required to establish the technical feasibility of a mining project.

Economic studies include all expenditures for economic studies (markets, product development, price studies, financing, etc.) required to establish the economic feasibility of a mining project.

Feasibility studies include all expenditures related to prefeasibility project reviews and to the production of feasibility studies required to develop and mine a deposit, and to obtain the required leases, permits and authorizations (excluding environmental and land access expenditures).

Environment-Related Expenditures

Environmental characterization includes all costs of environmental characterization and assessment (including environmental impact studies).

Environmental permits include all costs related to the process of meeting the legal and regulatory requirements or guidelines for environmental assessment and for obtaining permits (including preproduction permits) required for the work program under consideration.

Environmental protection includes costs for monitoring (additional to normal practices) and complying with laws, regulations and guidelines related to air emissions, liquid effluents, ground pollution, and wildlife and habitat protection. Environmental fines, if any, are included in this category.

Environmental restoration includes all costs of decommissioning, reclaiming and restoring, and monitoring, if required, after the completion of exploration and deposit appraisal field work.

Land Access-Related Expenditures

Land access requirements, permits and damages include all costs related to establishing impact and benefits agreements, socio-economic agreements, and other requirements for mine complex development and mine production, and the costs of rights of way, damages and permits for exploration and deposit appraisal work, including all associated legal fees, but excluding all environment-related costs.

Capital, Repair and Maintenance Expenditures

Capital expenditures for construction, machinery and equipment include expenditures by the company for work performed by contractors or by the company for its own account, such as salaries and wages, materials and supplies, and other charges such as engineering and consulting fees. Environment-related capital expenditures for protection and site restoration are included in this category.

Non-capitalized *repair and maintenance expenditures* consist of the gross non-capitalized repair expenditures on non-residential buildings, other structures and machinery, the costs of maintaining the restored mine site, and the routine care of assets, including environmental monitoring of the restored mine site.